AUSTRALIAN ORTHOPAEDIC ASSOCIATION

NATIONAL JOINT REPLACEMENT REGISTRY

Annual Report

2002

AUSTRALIAN ORTHOPAEDIC ASSOCIATION NATIONAL JOINT REPLACEMENT REGISTRY

ANNUAL REPORT

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Implementation of the Registry has been funded by a grant from the Commonwealth Government

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ISSN 1445-3657

Suggested citation:
Australian Orthopaedic Association National Joint Replacement Registry. Annual Report. Adelaide:AOA; 2002.

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NATIONAL JOINT REPLACEMENT REGISTRY

ANNUAL REPORT
2002

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September 1999 to December 2001

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PARTICIPATING HOSPITALS & COORDINATORS – August 2002

The hospitals listed below commenced contributing data to the Registry on or before August 2002. Not all the hospitals listed have provided data for this report.

SOUTH AUSTRALIA

Public Hospitals

Clare District Hospital
Kay Williamson, CN Theatre
Flinders Medical Centre
Jo Drabsch, CN Theatre
Gawler Health Services
Sharon Soones, RN Theatre
Lyell McEwin Hospital
Trudy Gayler, RN Theatre
Modbury Public Hospital
Jan Caufield, CN Orthopaedic Theatre
Mt *Barker District Soldiers Memorial Hospital*
Emma Crowder, RN Theatre
Mt Gambier Regional Hospital
Kay Main, RN Theatre
Murray Bridge Soldiers Memorial Hospital
Chris Jarvis, CN Theatre
Naracoorte Health Service
Leonie Schlein, CN Theatre
Noarlunga Hospital
Carole Dawson, RN Theatre
Northern Yorke Peninsula Hospital
Kerry Schultz, CN Theatre
Port Augusta Hospital
Minnie Reynolds, NUM Theatre
Port Lincoln Hospital
Marion Bassham, NUM Theatre
Port Pirie Hospital
Frances Reynolds, Clinical NUM Theatre
Queen Elizabeth Hospital
Carol Saniotis, NUM Theatre
Repatriation General Hospital
Linda Saunders, CN Theatre
Riverland Regional Hospital
Leanne Zerna, RN Theatre
Royal Adelaide Hospital
Deb White, CN Orthopaedic Theatre
South Coast District Hospital
Judy Anderson, CN Theatre
Whyalla Health Service
Carol McSorley, CN Theatre
Women's and Children's Hospital
Connie Fung, CN Theatre

SOUTH AUSTRALIA

Private Hospitals

Abergeldie Hospital
Yvette Rogers, CNC Theatre
Ashford Community Hospital
Paul Mitchell, RN Theatre
Blackwood Hospital
Dani McKenna, Clinical Manager, Theatre

SOUTH AUSTRALIA continued

Private Hospitals

Burnside War Memorial Hospital
Debbie Green, Medical Records
Calvary Hospital Adelaide Inc
Adele Alves, CN Orthopaedic Theatre
Central Districts Private Hospital
Linda Keech, CN Theatre
Flinders Private Hospital
Judy Parmiter, CN Theatre
Glenelg Community Hospital
Jan Lewanndowski, CN Orthopaedic Theatre
North Eastern Community Hospital
Maria Young, RN Theatre
Parkwynd Private Hospital
Dianne Perry, CN Theatre
Sportsmed SA
Sarah Gold, Medical Records
St Andrew's Private Hospital
Paul Grafton, RN Theatre
Stirling & District Hospital
Nick Clarke, CNC Theatre
The Memorial Hospital
Katrina Smith, Orthopaedic Liaison
Wakefield Hospital
Flo Smith, CN Theatre
Western Community Hospital
Margaret Stokes, RN Theatre

AUSTRALIAN CAPITAL TERRITORY

Private Hospitals

John James Memorial Hospital
Catherine Hindson, ADON Theatre
The National Capital Private Hospital
Kaye Vian, NUM Orthopaedic Theatre

Public Hospitals

The Canberra Hospital
Jo Clayton, CNS Orthopaedic Theatre

Public & Private Hospitals

Calvary Health Care
Tina Forshaw, CN Theatre

NORTHERN TERRITORY

Public Hospitals

Alice Springs Hospital
Neelika Dayananda, Consultant
Royal Darwin Hospital
Vivian Dunlop, NUM Theatre

Private Hospitals

Darwin Private Hospital
Kaylene Page, RN Pre-admission Clinic

Participating Hospitals & Coordinators – continued

WESTERN AUSTRALIA

Public Hospitals

Albany Regional Hospital
Margarita Rejecki, Clinical Manager Theatre
Armadale Health Service
Eleri Griffiths, Theatre Service Manager
Bunbury Regional Hospital
Brett Smith, Orthopaedic Technician Theatre
Fremantle Hospital
Stephen Johnston, Orthopaedic Technician Theatre
Geraldton Health Service
Vicki Richards, CN Theatre
Kalgoorlie Regional Hospital
Alison Carlsen, Clinical NUM Theatre
Royal Perth Hospital, Shenton Park
Lesley Pascoe, RN Theatre
Royal Perth Hospital, Wellington St
CarmelMcCormack, NUM Theatre
Sir Charles Gairdner Hospital
Sandra Miller, Quality Improvement Coordinator

Private Hospitals

Fremantle Kayleeya Hospital
Kay Golding, CN Orthopaedic Theatre
Galliers Private Hospital
Debra Carkeeg, Orthopaedic Technician, Theatre
Hollywood Private Hospital
Lyn Bradshaw, RN Theatre
Joondalup Health Campus
Karina Anderson, Health Records
Mercy Hospital Mt Lawley
Veronica Hill, RN Theatre
Mount Hospital
Jackie McDonald, Orthopaedic Coordinator
Peel Health Campus
Jan Birmingham, RN Orthopaedic Theatre
Rockingham Family Hospital
Dianne Clarke, RN Theatre
St John of God, Bunbury
Marianne Viebke, NUM Theatre
St John of God, Geraldton
Sue Campbell, RN Theatre
St John of God, Murdoch
Paul Maloney, Orthopaedic Technician Theatre
St John of God, Subiaco
Derek Williams, Orthopaedic Technician Theatre

TASMANIA

Public Hospitals

Launceston General Hospital
Paula Barrass, CN Orthopaedic Theatre
North West Regional Hospital
Bill Kerr, CN Orthopaedic Theatre
Royal Hobart Hospital
Colleen Neal, RN Theatre
Calvary Hospital
Cathryn Chick, CN Orthopaedic Theatre

TASMANIA

Private Hospitals

Hobart Private Hospital
Sarah Bird, Perioperative Services Manager
Mersey Community Hospital
Aitor Baonza, NUM Theatre
North-West Private Hospital
Jo Cain, RN Theatre
St Luke's Hospital
Denise McMahon, Patient Information Manager
St Vincent's Hospital
Stephanie Dilger, Theatre Receptionist

QUEENSLAND

Public Hospitals

Bundaberg Hospital
Karen Smith, Elective Surgery Coordinator
Cairns Hospital
Debbie Norris, Department of Orthopaedics
Gladstone Hospital
Maryanne Rettke, Nurse Practice Coordinator
Gold Coast Hospital
Allan Davies, NUM Theatre
Hervey Bay Hospital
Wendy Luckerbauer, RN Theatre
Ipswich Hospital
Libby McNaulty, NPC Theatre
Logan Hospital
Tina Muller, CNC Orthopaedic Ward
Mackay Hospital
Susan Meyer, RN Theatre
Maryborough Hospital
Heather Zillman RN, Theatre
Mater Misericordiae Public Adult's Hospital
Brigid Gillespie, CN Orthopeadic Theatre
Mater Misericordiae Public Children's *Hospital*
Jess Hadley, CN Theatre
Nambour General Hospital
Janine Detlefson, NUM Theatre
Prince Charles Hospital
Karen Zillman, CNC Theatre
Princess Alexandra Hospital
Audrey Hamilton, RN Theatre
Queen Elizabeth II Jubilee Hospital
Lisa Courtney, RN Theatre
Redcliffe Hospital
Narelle Doss, Health Information Manager
Rockhampton Base Hospital
Liz Murphy, CN Orthopaedic Theatre
Royal Brisbane Hospital
Lillian Olszewski, Department of Orthopaedics
Toowoomba Hospital
Mandy Robinson, RN Theatre
Townsville Hospital
Sharon Cook, RN Orthopaedic Theatre

Participating Hospitals & Coordinators – continued

QUEENSLAND continued

Private Hospitals

Allamanda Private Hospital
Maragaret Law, NUM theatre
Caboolture Hospital
Sue Adams, NUM Theatre
Caloundra Private Hospital
Christine Wells, CN Theatre
Calvary Private Hospital
Karen Muir, RN Theatre
Friendly Society's Hospital
Anne Whalley, Theatre Receptionist
Greenslopes Private Hospital
Jodie Tomkins RN, Yvonne Holmes RN, Theatre
Hillcrest Private Hospital
Lyn Martin, NUM Theatre
Holy Spirit Hospital
Jessica Morris, CN Theatre
Holy Spirit Northside Hospital
Norma Stanley, NUM Theatre
John Flynn Hospital
Di Sapwell, Manager Surgical Services
Logan Private Hospital
Cheryl Dennis, Perioperative Manager
Mater Misericordiae Hospital Bundaberg
Judy Tucker, CNS Orthopaedic Theatre
Mater Misericordiae Hospital Mackay
Karen Bedford, CNC Theatre
Mater Misericordiae Hospital Rockhampton
Lorelei Thomas, RN Theatre
Mater Misericordiae Hospital Townsville
Alicia Harris, CN Theatre
Mater Misericordiae Private Hospital
Ann Hayward, RN Theatre
Mater Private Hospital Redland
Erina Harris, RN Theatre
Nambour Private Hospital
Yvonne Hemingway, RN Theatre
Noosa Hospital
Janet McMeekin, RN Theatre
North West Private Hospital
Tracey Gordon, NUM Theatre
Peninsula Private Hospital
Janene Stewart, NUM Theatre
Pindara Private Hospital
Jan Barclay, Quality Coordinator Theatre
Pioneer Valley Hospital
Scott Cameron, NUM Theatre
Riverview Private Hospital
Liz Cline, CNC Theatre
St Andrew's Private Hospital
Gail Simpson, RN Orthopaedic Theatre
St Andrew's Toowoomba Hospital
Karen Transton, RN Theatre
St Andrew's War Memorial Hospital
Judith Kable, NUM Theatre

QUEENSLAND continued

Private Hospitals

St Stephen's Private Hospital
Carol Hewson, RN Theatre
St Vincent's Hospital
Judy Plotecki, RN Perioperative Services
St Vincent's Hospital, Robina
Moira Briggs, NUM Perioperative Services
Sunnybank Private Hospital
Claire Thomas, RN Theatre
The Sunshine Coast Private Hospital
Nerida Domenici, RN Theatre
The Wesley Park Haven Private Hospital
Braydon Rissell, CN Orthopaedic Theatre
Wesley Hospital
Carolyn Wilson, CNM Ward 2M

VICTORIA

Public Hospitals

Austin & Repatriation Medical Centre, Austin Campus
Dennis O'Leary, NUM Theatre
Austin & Repatriation Medical Centre, Repatriation Campus
Ian Manly, NUM Theatre
Ballarat Health Services
Joy Taylor, SNM, Perioperative Services
Bendigo Health Care Group
Marianne Dunn, NUM Theatre
Box Hill Hospital
Helga Ploschke, Quality Coordinator Orthopaedic Services
Cohuna District Hospital
Betty Thompson, CNC Theatre
Colac Community Health Service
Judy Kerr, RN Theatre
Dandenong Hospital
Karen Ferguson, RN, Paul Chung, RN Theatre
East Grampians Health Service
Jenny Sargent, NUM Theatre
Echuca Regional Health
Anne Dick, Associate Charge Nurse Theatre
Goulburn Valley Health
Ross Ebbott, CNS Orthopaedic Theatre
Latrobe Regional Hospital
Karen Little, Associate Unit NUM Theatre
Maroondah Hospital
Jodie Hoogenboom, Associate Unit NUM Theatre
Mildura Base Hospital
Gwenda Smith, NUM Theatre
Monash Medical Centre, Clayton Campus
Yolanda Whitehead, Associate Unit NUM Theatre
Monash Medical Centre, Moorabbin Campus
Sue Rosalie, A/CN Orthopaedic Theatre
Peninsula Health Service, Frankston Hospital
Kathy Allars, NUM Theatre
Portland & District Hospital
Neil Taylor, NUM Theatre

Participating Hospitals & Coordinators – continued

VICTORIA continued

Public Hospitals

Sandringham & District Memorial Hospital
Jo Holland, Orthopaedic Pre-admission Clinic
South West Healthcare Warrnambool Campus
Tony Kelly, NUM Theatre
St Vincent's Public Hospital
Julie Connors, CNS Orthopaedic Theatre
Stawell District Hospital
Chris Shorten, NUM Theatre
Swan Hill District Hospital
Eng Bryne, CNC Theatre
The Alfred
Caroline McMurray, Coordinator Orthopaedic Dept
The Geelong Hospital, Barwon Health
Robert Cockayne
The Northern Hospital
Siew Perry, AUM Theatre
The Royal Melbourne Hospital
Janet Duggan, Prostheses Coordinator Theatre
Wangaratta District Base Hospital
Lois Foley, NUM Theatre
West Gippsland Healthcare Group
Christine Evans, CAN Theatre
West Wimmera Health Service
Christine Dufty, NUM Theatre
Western District Health Service
Mark Stevenson, NUM Theatre
Western Hospital
Wayne Lehman, RN, Vicki Mahaljcek, RN Theatre
Williamstown Hospital
Kym Sureda, RN Theatre
Wimmera Health Care Group
Pam Muszkieta, NUM Theatre
Wonthaggi District Hospital
Gail Huitema, NUM Theatre

Private Hospitals

Baronor Private Hospital
Chan Leong, NUM Theatre
Bayside Private Hospital
Michelle Donegan, NUM Theatre
Beleura Private Hospital
Jean Leyland, RN Theatre
Bellbird Private Hospital
Heather Edis, RN Theatre
Cabrini Private Hospital, Brighton
Sharni Clark, Project Officer
Cabrini Private Hospital, Malvern
Sharni Clark, Project Officer
Cotham Private Hospital
Susan Leech, RN Orthopaedic Theatre
Epworth Hospital, Epworth Campus
Tilak Weerakkody, RN Theatre
Epworth Hospital, Bethesda Campus
Ronelle Kok, RN Theatre

VICTORIA continued

Private Hospitals

Freemasons Hospital
Claudia Nozzolillo, CNS Orthopaedic Theatre
Hartwell Private Hospital
Pat Wilding, NUM Theatre
John Fawkner Hospital
Melissa Evans, RN Theatre
Knox Private Hospital
Sally Thomas, Orthopaedic Liaison Nurse
Latrobe University Medical Centre
Joyce Zara, AUM Theatre
Maryvale Private Hospital
Janine Johnston, A/CN Orthopaedic Theatre
Masada Private Hospital
Jeanette MacLeaine, RN Theatre
Melbourne Private Hospital
Fran Bartholomew, RN Orthopaedic Theatre
Mentone Private Hospital
Ann Lacey, NUM Theatre
Mildura Private Hospital
Elizabeth Collihole, ACN Theatre
Mitcham Private Hospital
Julie Nankivell, RN, Judith Bond, RN Theatre
Mount Alvernia Mercy Hospital
Jenny Dillon, ACN Theatre
Mount Waverly Private Hospital
Janis Webster, NUM Theatre
Northpark Private Hospital
Gail Evans, NUMTheatre
Peninsula Private Hospital
Donna Hadkiss, RN Orthopaedic Theatre
Ringwood Private Hospital
Belinda Vandenberg, CNS Orthopaedic Theatre
Shepparton Private Hospital
Liz Harper, Vicki Lloyd, Orthopaedic Case Manager
South Eastern Private Hospital
Veronica Rust, NUM Theatre
St John of God, Ballarat
Cameron Morgan, Resource Manager
St John of God, Geelong
Gaye Hose, CNS Orthopaedic Theatre
St Vincent's and Mercy Private Hospital, Mercy Campus
Margaret Scanlon, ANUM Theatre
St Vincent's and Mercy Private Hospital, St Vincent's Campus
Gillian Burgess, RN Theatre
The Avenue Hospital
Annellen Watson, RN Theatre
The Geelong Private Hospital
Anne Day, CNS Orthopaedic Theatre
The Valley Private Hospital
Jan Stone, NUM Perioperative Services
Vimy House Private Hospital
Margaret Baker, NUM Theatre

Participating Hospitals & Coordinators – continued

VICTORIA continued

Private Hospitals

Wangarratta Private Hospital
Cathy Duncan, NUM Theatre
Warringal Hospital
Judy McIvor, RN Theatre
Western Private Hospital
Sophie Holod, NUM Theatre

NEW SOUTH WALES

Public Hospitals

Albury Base Hospital
Elwyn Black, NUM Theatre
Armidale Hospital
Debbie Spokes, NUM Theatre
Auburn Health Service
Helen Joyce, SN Manager Theatre
Bankstown/Lidcombe Hospital
Richard Ibarra, Orthopaedic Resource Person
Bega District Hospital
Pauline Blair, RN Theatre
Blacktown Hospital
Sergio Jumanong, RN Theatre
Bowral and District Hospital
Barbara Walsh, NUM Theatre
Broken Hill Health Service
Sue Beahl, RN Theatre
Campbelltown Hospital
Bev Hill, CNS Orthopaedic Theatre
Coffs Harbour Health Campus
David Metcalf, Quality Manager
Concord Repatriation Hospital
Cathy Connelly, NUM Theatre
Dubbo Base Hospital
Cathy Chapman, Theatre Clerk
Fairfield Hospital
Stella George, NUM Theatre
Gosford Hospital
Felecia Bristow, Set-up Coordinator Theatre
Goulburn Base Hospital
Debbie Mallon, NUM Theatre
Hornsby & Ku-Ring-Gai Hospital
Bessie Chu, CNS Theatre
John Hunter Hospital
Pam Arnold, NUM Equipment Theatre
Lismore Base Hospital
Maryanne Wilson RN, Val Armstrong RN, Glen Nettle RN, Theatre
Liverpool Health Service
Ros Berryman, SNM Operating Theatre
Maitland Hospital
Margaret Mantle, NUM Theatre
Manly District Hospital
Karen Jones, NUM Theatre

NEW SOUTH WALES continued

Public Hospitals

Manning Base Hospital
Graham Cooke, RN Theatre
Mona Vale Hospital
Sue Travis, CN Orthopaedic Theatre
Mt Druitt Hospital
Glennis Elliot, SNM Theatre
Murwillumbah District Hospital
Lynne Penglase, NUM Theatre
Nepean Hospital
Jenny Smith, CNC Orthopaedic Ward
Orange Health Service
Susie Weeks, CNS Theatre
Royal Newcastle Hospital
Rosalee Baird, NUM Theatre
Royal North Shore Hospital
Eileen Cole, Dept of Orthopaedics
Royal Prince Alfred Hospital
Helen Wright, NUM Theatre
Ryde Hospital
Karen Wainstein, NUM Theatre
Shoalhaven Group Hospital
Miep Mulder, NUM, Dale LindsayA/NUM Theatre
St George Hospital
Simon Cheng, CNS Orthopaedic Theatre
St Vincent's Public Hospital
Bernadette Keenan, NUM Theatre
Sydney Hospital & Sydney Eye Hospital
Jennifer McLean
Tamworth Base Hospital
Kevin Attart, RN Theatre
The Blue Mountains District ANZAC Memorial Hospital
Cathy Gallimore, NUM Theatre
The Canterbury Hospital
Jenny Cubit, NUM Theatre
The Institute of Rheumatology and Orthopaedic Surgery
Alex Vesley, NUM Theatre
The Prince of Wales Hospital
Phyllis Davis, NUM Theatre
The Sutherland Hospital
Lisa Hatton, RN Theatre
Tweed Heads District Hospital
Chris Ryan, CNS Orthopaedic Theatre
Wagga Wagga Base Hospital
Alison Giese, CNS Orthopaedic Theatre
Westmead Hospital
Dana Bowker, RN Theatre
Wollongong Hospital
Pamela Rex, CNS Orthopaedic Theatre
Wyong Hospital
Janice Cunningham, A/NUM Theatre
Marilyn Randall, CNS Orthopaedic Theatre

Participating Hospitals & Coordinators – continued

NEW SOUTH WALES continued

Private Hospitals

Albury Wodonga Private Hospital
Beverly Francis, CNS Orthopaedic Theatre
Armidale Private Hospital
Cheryl Constance, NUM Theatre
Baringa Private Hospital
Marilyn Chauncy, Orthopaedic Resource Manager
Berkely Private Hospital
Michelle Turner, QA/Education Coordinator
Brisbane Waters Private Hospital
Ros O'Shea, Coordinator Orthopaedic Services Theatre
Calvary Health Care Riverina
Nerida Stevens, Clinical Coder
Cape Hawk Private Hospital
Karon Devenish, Quality Manager,
Dianne Stirling, RN Theatre
Dalcross Private Hospital
Jan Livingstone, NUM Theatre
Delmar Private Hospital
Ingrid Statis, RN Theatre
Dubbo Private Hospital
Gail Priest, NUM Theatre
Hawkesbury Health Service
Belinda Azhari, RN Theatre
Holroyd Private Hospital
Belinda Azhari, RN Theatre
Hunter Valley Private Hospital
Margaret Water, NUM Theatre
Hunters Hill Private Hospital
Claire McLachlan, NUM Theatre
Hurstville Community Hospital
Linda Lanham, Case Manager
Illawarra Private Hospital
Jan Goldrick, Theatre
Kareena Private Hospital
Carlien Paulin, ADON Theatre
Lake Macquarie Private Hospital
Robert Reddie, Theatre
Lingard Private Hospital
Jo Bryan, NUM Theatre
Macarthur Private Hospital
Brenda Wood, Case Manager General Ward
Mater Misericordiae Private Hospital
Rosemary Laver, Manager Pre-admission Clinic
Mayo Private Hospital
Ms Ellie Richardson, NUM Theatre
Mosman Private Hospital
Sue Long, NUM Theatre
Nepean Private Hospital
Jan Wernadt, NUM Theatre
NIB Private Hospital
Jody Kelly, RN Theatre

NEW SOUTH WALES continued

Private Hospitals

North Gosford Private Hospital
Claire Monger, RN Orthopaedic Theatre
North Shore Private Hospital
Eileen Cole, Department of Orthopaedics
Nowra Community Private Hospital
Jo Naughton, NUM Theatre
Orange Private Hospital
James Bird, RN Operating Theatre
Port Macquarie Base Hospital
Pam Campbell, CN Theatre
Corrine Austine, Theatre Clerk
Port Macquarie Private Hospital
Susie Storm, CNS Orthopaedic Theatre
Shellharbour Private Hospital
Liz Quennel, Medical Records
Southern Highlands Private Hospital
Karen Cooper, NUM Theatre
St George Private and Medical Centre
Rhonda Nance, NUM Theatre
St Luke's Hospital Complex
Pauline Morely, NUM Theatre
St Vincent's Private Hospital Bathurst
Mary Sands, NUM Theatre
St Vincent's Private Hospital Darlinghurst
Astiness Kalach, Health Information Manager
St Vincent's Private Hospital Lismore
Loris Gordon, RN Care Coordinator Orthopaedics
Strathfield Private Hospital
Jan Hubbard, RN Theatre
Sydney Adventist Private Hospital
Bronwyn Stewart, CNS Theatre
Sydney Private Hospital
Jeremy Moles, NUM Theatre
Sydney Soutwest Private Hospital
Margaret Flavelle, Orthopaedic Case Manager
Tamara Private Hospital
Lillian Blair, CNS Orthopaedic Theatre
The Hills Private Hospital
Julie Guthrie, Clinical Orthopaedic Coordinator
The Prince of Wales Private Hospital
Amanda Linsley, Specialty Team Leader Orthopaedics
Toronto Private Hospital
Helen Cox, NUM Theatre
Warners Bay Private Hospital
Robyn Dickenson, RN Theatre
Westmead Private Hospital
Leona Higgins, CNS Orthopaedic Theatre
Westside Private Hospital
Ruth Wigley, NUM Theatre

ACKNOWLEDGEMENTS

The Registry would like to acknowledge the co-operation and support provided by hospitals, orthopaedic surgeons, registrars and nursing staff. In addition, the Registry has continued to receive support and invaluable assistance from the Federal Government, State Health Departments and Orthopaedic Companies.

INTRODUCTION

This is the third annual report of the Australian Orthopaedic Association National Joint Replacement Registry. Following a successful application in March 1998, the Federal Government provided funding to the Australian Orthopaedic Association (AOA) to establish the National Joint Replacement Registry. Since the release of the 1st Report in 2000 the Registry has continued to grow at a rapid pace. At the time of this report all 296 Hospitals undertaking joint replacement in Australia have agreed to contribute data to the Registry. At the end of August 2002 the Registry had received information on 72,063 hip and knee procedures.

BACKGROUND TO THE REGISTRY

Joint replacement surgery is a common procedure that has considerable success in alleviating pain and disability in individuals suffering a variety of major joint disorders. In Australia this year close to 50,000 joint replacement procedures will be performed. Previously, joint replacement was reserved for the elderly. However, due to the success of the procedure it is increasingly used in younger individuals. This, combined with an ageing population, has resulted in an increase in the incidence of primary joint replacement. The rate of revision surgery is also increasing. More patients are surviving longer than the life expectancy of the joint replacement. Revision surgery is associated with increased morbidity and mortality and has a far less successful outcome than primary joint replacement. As such it is essential to ensure that everything possible is done to limit the rate of revision surgery.

There is a concern about the increasing number and variety of prostheses now available on the Australian market. More recent prostheses are the product of new technologies and for many, the mid to long term survival rates are unknown. It is known that there is considerable variation in outcome for different prostheses. Surgical technique and specific patient characteristics also effect longevity. Inadequate outcome data, as well as variability related to different surgical techniques and diagnostic groups, have made it difficult for surgeons to identify the relative effectiveness of different prostheses.

The AOA National Joint Replacement Registry simultaneously monitors all types of prosthetic design. A registry is the most effective method of determining which prostheses and surgical techniques are most successful for given demographic and diagnostic sub-groups within the community. A number of registries have been established in other countries. The ability to identify factors important in achieving successful outcomes has resulted in both improved standards and significant cost savings in those countries.

AIMS OF THE REGISTRY

- Determine demographic and diagnostic characteristics of patients undergoing joint replacement surgery nationally
- Provide accurate information on the use of different types of prostheses in both primary and revision joint replacements
- Evaluate the effectiveness of different types of joint replacement prostheses and surgical techniques at a national level
- Compare the Australian joint replacement experience to that of other countries
- Provide confidential data to individual surgeons and hospitals to audit their joint replacement surgery
- Educate Australian orthopaedic surgeons in the most effective prostheses and surgical techniques to achieve successful outcomes

REGISTRY OVERVIEW

Implementation of the Registry began in September 1999. A specific Registry Committee appointed by the Federal Board of the AOA manages the Registry. The committee consists of the Chairman, Registry Director, an orthopaedic surgeon from each state and territory and two orthopaedic industry representatives (see back of cover for committee members). The Director of the Registry is responsible for the overall management. The Coordinator is employed by the AOA and is involved in maintaining cooperation of hospitals, surgeons and government, and in implementing new strategies and in coordinating the preparation of the annual report. The Data Management and Analysis Centre, University of Adelaide, is contracted by the AOA to provide data management and analysis services.

Registry Implementation

Hospitals nationally, both public and private that undertake hip or knee replacement were contacted to participate in data collection for the Registry. Following initial contact with hospital administration and orthopaedic surgeons an Information Collection Document outlining the Registry and data collection was provided to each hospital. The document was prepared in a manner to allow hospital administrations the choice of presenting the document to an ethics, quality assurance or medical advisory committee. Once approval was given, procedures were implemented to begin data collection. Each hospital nominated a hospital coordinator (usually a member of theatre nursing staff) to liaise with Registry staff.

Implementation of the Registry commenced in nine South Australian hospitals in September 1999. Since that time all hospitals (296) in Australia that undertake joint replacement have agreed to submit data. Currently the Registry receives information on over 4000 procedures per month.

Data for 2002 Report

This report has been prepared using data collected during the period September 1999 to December 2001. This includes data collected from South Australia, Western Australia, Queensland, Northern Territory, Tasmania, Victoria, Australian Capital Territory and New South Wales hospitals. New South Wales was the most recent state to commence data collection. Data from 67 of the 95 NSW hospitals are included in this report. The remaining hospitals began data collection in 2002 and this information will be included in the 2003 report.

Data Collection Method

At this time, hospitals participating in the Registry provide data on specific Registry forms. The forms are completed in theatre at the time of surgery and are returned to the Registry each month. Initial discussions with hospitals indicated that most hospitals would prefer to send the information to the Registry electronically. The majority of hospitals do not collect all the information required by the Registry on either theatre or hospital information systems. As a first stage, to encourage the use of electronic formats, we have asked hospitals to email to the Registry each month a basic file containing limited data we can use to verify the paper-based collection. Hospitals are provided with a simple, comma delimited file format that verifies that a patient had an operation on a specified date. Prostheses details are not included. Of the participating hospitals only 40% have been able to provide this file. For those sending the files, 56% are able to send the complete data required. Only 22% of hospitals have been able to send the required format. All hospitals are however, provided with electronic file formats of the complete data set to meet Registry requirements when computer or software systems are enhanced or updated.

Data Validation

An essential feature of the Registry is validation of collected data including hospital, patient, procedure and prosthesis details. Sources that have been identified as having information that can be used to validate Registry data are state and territory health departments, hospitals and orthopaedic companies. Various levels of validation apply to each source. The state health department data are used to validate the number of joint replacement procedures. Hospital data are matched to individual patient data and side of surgery. Company data can be used to validate patient and prosthesis data.

Over the last twelve months the Registry has concentrated on the continued development of the detailed validation process using state health department data.

This involves a sequential multi-level matching process. Initial matching of Registry and state health department data is undertaken using hospital and hospital identity number. Subsequent matching is undertaken on relevant procedure codes and appropriate admission time period. This individual patient/procedure validation has been trialled for South Australian and Western Australian data. Errors in data can occur within Government and Registry data at any of these levels. It has been pleasing to note that an initial matching of between 80 to 90% is achieved when this process is used. The subsequent errors in matching are then managed depending on the nature of the error.

A small number of these errors can only be resolved by contacting the original treating hospital. When the Registry receives notification of a joint replacement procedure that is in addition to state health department data, the Registry procedure is to accept that the notification is correct.

The notification rate to the Registry remains excellent. In comparison to state health department data the South Australian notification is just over 97%. When comparing Registry and Western Australian data, the Registry has been notified of a small number of additional joint replacement procedures compared to that provided by the WA health department.

What is New in 2002

This year there has been a number of new sections added to the report. These include an analysis of femoral head size (which can be found in the hip replacement section), as well as the use of bone cement and the presentation of mortality figures. It is intended to provide additional information with each new report.

GOVERNMENT JOINT REPLACEMENT DATA 2000 – 2001

Hospitals, both public and private, send regular reports to the health department in each state and territory. These reports include information on hospital inpatient stay, e.g. reason for admission, length of stay and operation(s) etc. The Registry obtained data for specific ICD 10 AM codes (see Appendix 2) from each health department on the number and type of joint replacement procedures undertaken in both public and private hospitals for the period 1st July 2000 to 30th June 2001. While the accuracy of the data collected from the health departments is likely to be high the Registry is not aware that any validation has been undertaken. These data provide general information on the frequency of joint replacement but do not provide any outcome information. This information is presented as an overview of joint replacement surgery nationally. Due to the relatively small number of procedures undertaken in the Australian Capital Territory (ACT) and Northern Territory (NT), it is necessary to combine the figures to ensure anonymity.

Hip and knee joint replacement increased from 42,569 to 46,409 procedures during the last year. This is an overall increase of 9% (Table G2). Most of this increase occurred within the private hospital system. There has been an increase in the combined total of hip and knee replacements in private hospitals over the last two years (12.4%, 1999-2000 and 16%, 2000-2001). This increase is not reflected in the public hospital system (-2.7%, 1999-2000 and 0.5%, for 2001) (Table G4).

The overall increase in hip and knee replacement comprises a 6.7% increase in hip procedures and an 11.7% increase in knee procedures. Primary total hip replacement increased by 8.3% and primary total knee replacements by 10.0%.

Patellar/trochlear and unicompartmental knee replacements have been collected separately for the second year. Patellar/trochlear procedures increased by 18.4% and unicompartmental increased by 28.8% (Table G2).

On the data presented, Tasmania had the largest increase in joint replacement (20.7%). These figures will be slightly inflated as not all private hospital data were available for last years report. It was estimated that the numbers reported for Tasmania at that time were down by approximately 100 joint replacements. South Australia had an increase of 14.5% and Queensland 11.8%. Western Australia had the lowest increase (0.9%) and the Australian Capital Territory and Northern Territory had a decrease of 5.7%. This however follows a considerable increase reported last year (Table G3).

The incidence of the various types of hip procedures is similar between all states and territories. The largest difference was in partial hip replacement (16.8% Tasmania) and 27.5% (Queensland). Primary hip replacement ranged from 57.6% in Queensland to 67.8% in Tasmania (Table G1).

The percentage of all revision hip replacement surgery for Australia during this period was 14.1% (Graph G4). It is not possible to determine from the health department data which types of hip replacements (partial, primary or revision) have been revised. Western Australian (13.0%) had the lowest incidence of revision hip replacement and the Australian Capital Territory/Northern Territory had the highest (16.4%).

There is a large variation in the incidence of unicompartmental knee replacement. New South Wales has the highest incidence with 18.4%. Primary total knee replacement varied from 72.5% in New South Wales to 82.9% in Queensland. The national percentage for revision knee surgery is 9.3% (Graph G5). As for hips, it is not possible to determine which types of replacements

(patellar/trochlear, unicompartmental, primary or revision) have been revised. New South Wales had the lowest percentage of revision knee replacement (7.8%) and Western Australian had the highest (11.2%).

There is a variation in incidence per 100,000 of population for all hip replacement procedures between the states and territories. It is highest in Tasmania (171.2) and South Australia (166.7) and lowest in Queensland (102.6) and Australian Capital Territory/Northern Territory (106.3) (Table G5).

Similar variations between state and territories are also evident for knee replacement. South Australia has the highest incidence (153.9). Total knee replacement is much less frequent in Victoria (92.3) and the Australian Capital Territory/Northern Territory (86.2).

It remains unknown why these differences exist. It is an area requiring further study. It is clear however that the number of all types of hip and knee replacement, including revisions, continues to increase (Table G6).

Table G1: Number *(percent)* of Hip & Knee Replacements Nationally 1/7/2000 – 30/6/2001

Type of joint replacement	*NSW**	*VIC**	*QLD*	*WA*	*SA*	*TAS**	*ACT/ NT**	*Aust. total**
Hip replacement								
Partial	1639	1416	1024	518	617	135	102	5451
	(21.5)	*(21.3)*	*(27.5)*	*(21.8)*	*(24.6)*	*(16.8)*	*(18.8)*	*(22.5)*
Primary total	4958	4268	2145	1549	1555	546	353	15374
	(65.0)	*(64.2)*	*(57.6)*	*(65.2)*	*(62.1)*	*(67.8)*	*(64.9)*	*(63.4)*
Revision	1035	969	553	309	333	124	89	3412
	(13.6)	*(14.6)*	*(14.9)*	*(13.0)*	*(13.3)*	*(15.4)*	*(16.4)*	*(14.1)*
Total	**7632**	**6653**	**3722**	**2376**	**2505**	**805**	**544**	**24237**
	(100.0)	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*
Knee replacement								
Patellar/trochlear	111	39	30	11	14	5	2	212
	(1.3)	*(0.9)*	*(0.8)*	*(0.5)*	*(0.6)*	*(0.9)*	*(0.5)*	*(1.0)*
Unicompartmental	1571	504	217	145	295	10	47	2789
	(18.4)	*(11.3)*	*(5.7)*	*(6.9)*	*(12.8)*	*(1.8)*	*(10.7)*	*(12.6)*
Primary total	6195	3450	3136	1704	1801	474	348	17108
	(72.5)	*(77.4)*	*(82.9)*	*(81.4)*	*(77.9)*	*(87.3)*	*(78.9)*	*(77.2)*
Revision	664	463	402	234	202	54	44	2063
	(7.8)	*(10.4)*	*(10.6)*	*(11.2)*	*(8.7)*	*(9.9)*	*(10.0)*	*(9.3)*
Total	**8541**	**4456**	**3785**	**2094**	**2312**	**543**	**441**	**22172**
	(100.0)	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*	*(100.0)*
State Total	**16173**	**11109**	**7507**	**4470**	**4817**	**1348**	**985**	**46409**

Note: **entries do not equal 100% due to rounding*

Table G2: Hip and Knee Joint Replacement Percentage Changes 1/7/2000 – 30/6/2001 Relative to 1/7/1999 – 30/6/2000

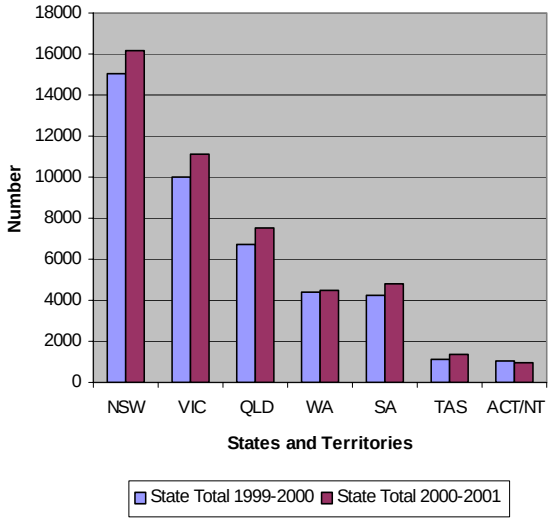
Type of joint replacement	Aust. Total 1/7/'98-30/6/'99	Aust. Total 1/7/'99-30/6/'00	Aust. Total 1/7/'00-30/6/'01	Percentage change relative to 1999-2000
Hip replacement				
Partial	4985	5285	5451	3.1
Primary total	13848	14193	15374	8.3
Revision	2864	3239	3412	5.3
Total	**21697**	**22717**	**24237**	6.7
Knee replacement				
Patellar/trochlear	N/K	179	212	18.4
Unicompartmental	N/K	2165	2789	28.8
Primary total	17085	15552	17108	10.0
Revision	1734	1956	2063	5.5
Total	**18819**	**19852**	**22172**	11.7
National Total	**40516**	**42569**	**46409**	**9.0**

Note: *N/K means not known. These data were not available until 1999-2000. In previous years patellar/trochlear and unicompartmental were included in primary total knee replacement.*

Table G3: State and Territories Number and Percentage Changes for combined Hip and Knee Replacement 1/7/2000 – 30/6/2001 Relative to 1/7/1999 – 30/6/2000

States and Territories	State Total 1/7/'98-30/6/'99	State Total 1/7/'99-30/6/'00	State Total 1/7/'00-30/6/'01	Percentage change relative to 1999 – 2000
NSW	14268	15044	16173	7.5
VIC	9419	10013	11109	10.9
QLD	6648	6714	7507	11.8
WA	4151	4428	4470	0.9
SA	4103	4208	4817	14.5
TAS	1041	1117	1348	20.7
ACT/NT	886	1045	985	-5.7
National Total	**40516**	**42569**	**46409**	**9.0**

Graph G1: State & Territories Total Joint Replacements 1/7/1999 – 30/6/2000 & 1/7/2000 – 30/6/2001



Graph G2: Hip and Knee Joint Replacement Surgery Public & Private Hospitals 1/7/2000 – 30/6/2001

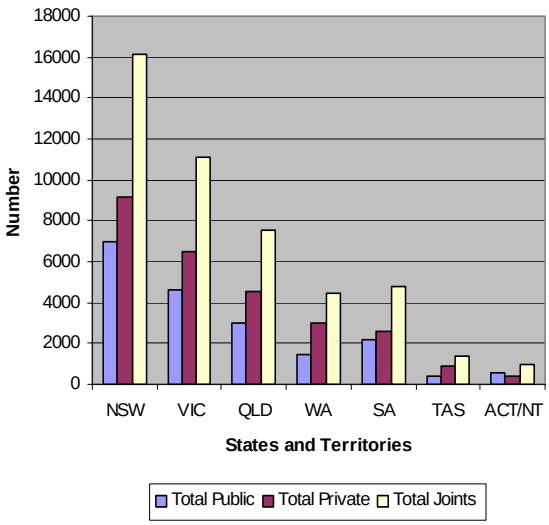


Table G4: Public & Private Percentage Changes per year for last 4 years 1st July – 30th June

Year	*Public*	*Private*	*Total Joints* *(hip & knee)*
1997-1998	18777	19919	38696
1998-1999	19694 ***(4.9%)***	20822 ***(4.5%)***	40516 ***(4.7%)***
1999-2000	19157 ***(-2.7%)***	23412 ***(12.4%)***	42569 ***(5.1%)***
2000-2001	19251 ***(0.5%)***	27158 ***(16.0%)***	46409 ***(9.0%)***

Incidence of Hip and Knee Replacement

Table G5: Incidence of Hip and Knee Joint Replacement per State & Territory per 100,000 of Population for 2000 - 2001

Type of joint replacement	*NSW* ***Pop.*** *6532500*	***VIC*** ***Pop.*** *4829000*	***QLD*** ***Pop.*** *3627800*	***WA*** ***Pop.*** *1909800*	***SA*** ***Pop.*** *1502400*	***TAS*** ***Pop.*** *470300*	***ACT/NT*** ***Pop.*** *511800*	***AUST.*** *Pop.* *19386700*
Hip replacement								
Partial	25.1	29.3	28.2	27.1	41.1	28.7	19.9	28.1
Primary total	75.9	88.4	59.1	81.1	103.5	116.1	69.0	79.3
Revision	15.8	20.1	15.2	16.2	22.2	26.4	17.4	17.6
Total	**116.8**	**137.8**	**102.6**	**124.4**	**166.7**	**171.2**	**106.3**	**125.0**
Knee replacement								
Patellar/trochlear	1.7	0.8	0.8	0.6	0.9	1.1	0.4	1.1
Unicompartmental	24.0	10.4	6.0	7.6	19.6	2.1	9.2	14.4
Primary total	94.8	71.4	86.4	89.2	119.9	100.8	68.0	88.2
Revision	10.2	9.6	11.1	12.3	13.4	11.5	8.6	10.6
Total	**130.7**	**92.3**	**104.3**	**109.6**	**153.9**	**115.5**	**86.2**	**114.4**
State total	**247.6**	**230.0**	**206.9**	**234.1**	**320.6**	**286.6**	**192.5**	**239.4**

Note: *The Total Australian population includes Cocos Island, Xmas Island and Jarvis Bay Territory. The displayed value of the total hip and knee replacement rate per 100,000 population may not equal the sum of the displayed figures due to rounding.*

The population figures were obtained from the Australian Bureau of Statistics. Australian Demographics Statistics publication no. 3101.0, June quarter, 2001.

Graph G3: Incidence of Joint Replacement by State & Territories 2000 - 2001

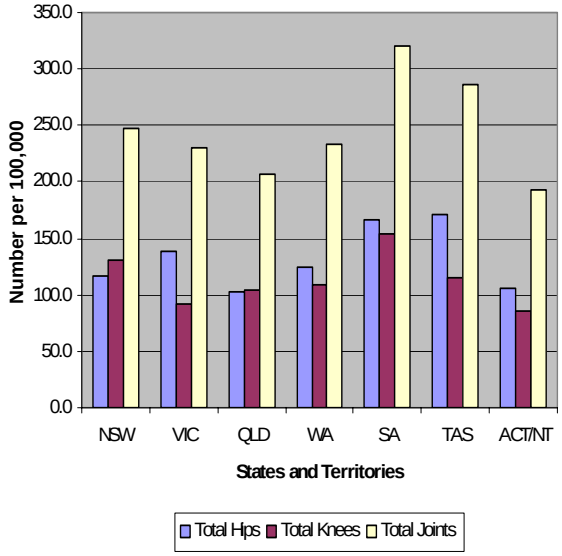
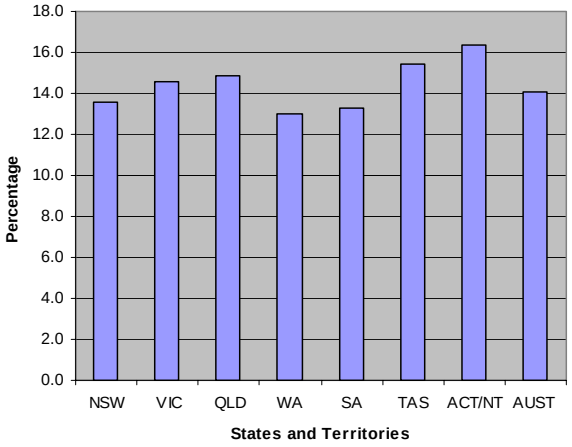


Table G6: Incidence of Different Hip and Knee Joint Replacement Procedures per 100,000 of Population for Australia for 1997-1998 to 2000 - 2001

Type of joint replacement *population as at June 30th*	**1/7/97-30/6/98** *18730359*	**1/7/98-30/6/99** *18966800*	**191/7/99-30/6/00** *19157200*	**1/7/00-1/6/01** *19386700*
Hip replacement				
Partial	26.4	26.3	27.6	28.1
Primary total	72.3	73.0	74.1	79.3
Revision	15.5	15.1	16.9	17.6
Total	**114.1**	**114.4**	**118.6**	**125.0**
Knee replacement				
Femoral Trochlear	N/A	N/A	0.9	1.1
Unilateral	N/A	N/A	11.3	14.4
Primary total	83.3	90.1	81.2	88.2
Revision	9.2	9.1	10.2	10.6
Total	**92.5**	**99.2**	**103.6**	**114.4**
Total	**206.6**	**213.6**	**222.2**	**239.4**

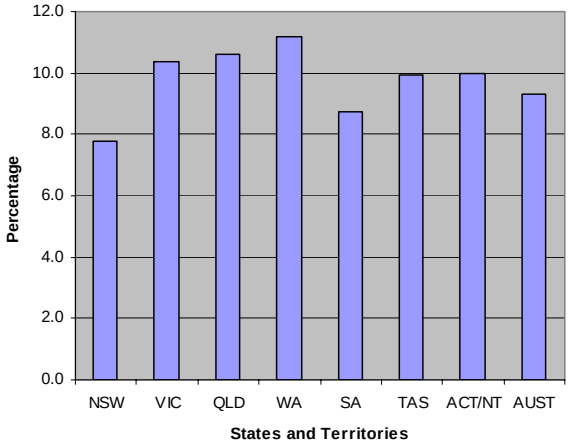
Revision Surgery for 2000-2001

Graph G4: Percentage of Revision Hip Replacement 2000 - 2001



Graph 4 represents, within each state, the percentage of hip surgery that was revision surgery for 2000 – 2001. It is not possible to determine which type (partial, primary or revision) of hip replacement had been revised.

Graph G5: Percentage of Revision Knee Replacement 2000 - 2001



Graph 5 represents, within each state, the percentage of knee surgery that was revision surgery for 2000 – 2001. Primary total or uni as well as revision knee replacements may have been revised.

AOA National Joint Replacement Registry
Hip Replacement Data

The AOA NJRR data analysed for this report was collected from 1/9/1999 to 31/12/2001. The staged implementation of the registry has meant that an increasing proportion of the national joint replacement data has been collected as time has progressed. In the 2001 report approximately 24% of all hips undertaken during 2000 were included. In this report almost 70% of the hip replacement procedures undertaken in 2001 have been recorded. Next year's report will contain information on well over 90% of the 2002 joint replacement procedures.

This report includes data from all states and territories. Data collection for many Victorian hospitals did not start until sometime in 2001. Some NSW hospitals commenced collection in the latter half of 2001 and the remainder during 2002.

Demographics and Diagnosis

Information on 22,723 hip replacement procedures is presented. The majority of hip procedures are primary total hip replacements (68.8%) followed by primary partial hip replacements (17.6%), and revision hips (13.6%). Apart from a small decrease in revisions (14.1% to 13.6%) compared to the 2001 Report, these figures represent little change in the relative proportion of procedures.

As emphasised last year, the revision figure does not reflect the revision rate but is the proportion of hip replacements that are revision operations. Revisions listed include revision of all types of primary procedures (partial and total) as well as previous revision procedures. The revision rate remains unknown and can only be determined by linking previous procedures to subsequent re-operations. To determine outcome, it is necessary to calculate revision rates for specific procedures and prostheses, and adjust these results for factors known to influence the potential for revision. The Registry is the only mechanism in Australia to achieve this.

Compared to the 2001 report, the age for primary hip replacement is slightly younger in men (Table H4), but there is little change in ages for partial and revision hip replacements (Tables H3-H5).

The number of females undergoing all types of hip replacement is greater than males (Tables H2, H4 & H5), in particular for partial hip replacements where the incidence is approximately 3:1 (Table H3).

Fracture of the neck of femur is the most common diagnosis for primary partial hip replacement. Partial hip replacement is used for a small number of diagnoses of osteoarthritis and tumour (Table H6). Osteoarthritis is the principal diagnosis for primary hip replacement (Table H7), with a small percentage for avascular necrosis (4.7%) and rheumatoid arthritis (2.0%). As previously, avascular necrosis is recorded as the principal diagnosis when associated with osteoarthritis.

The reasons for revision surgery are largely the same as reported last year. Aseptic loosening and dislocation remain the principal causes (Table H8).

Prosthesis Usage and Fixation for Primary Partial Hip Replacements

This report details information on 3996 primary partial hip replacements. The unipolar monoblock prosthesis accounts for 68.6% of all partial hip prostheses. Bipolar replacements are more common than unipolar modular hip replacements: 22.1% compared to 9.1% (Table H9).

The cementless Austin-Moore is the most commonly used unipolar monoblock prosthesis (75.8%). The cemented Thompson is used less frequently (21.4%), although this has increased compared to the 2001 Report. As can be seen in Table H10

there are small numbers of Austin-Moore prostheses that have been cemented, and alternatively, some Thompson prostheses that have been inserted in a cementless manner. These data has been verified with the relevant hospitals.

The mean age for primary partial hip replacement is substantially older than primary total and revision hip replacement (Tables H3, H4 & H5). There is also a difference in age depending on the type of partial hip replacement used. The mean age of patients receiving unipolar monoblock prosthesis is 84 years compared to 79 years for the bipolar and unipolar modular hips (data not shown). There are a number of different bipolar and unipolar prostheses that have been used. Specifically, 21 different femoral stems were combined with 10 and 12 different heads respectively for unipolar and bipolar replacements (Table H10).

Prosthesis Usage and Fixation for Primary Total Hip Replacement

The 15,641 primary total hip replacements include cemented, cementless, and hybrid conventional total hip replacements (Table H1), as well as 796 resurfacing and thrust plate prostheses (Table H11). Cement fixation of both components accounts for 21.3% of all conventional primary total hip replacements. This is not as common as cementless (38.3%), or hybrid fixation (35.4%) (Table H11). A cemented femoral stem and a cementless acetabular component is the most common hybrid combination, (99.3%) (Table H14). A relatively small number of hybrid replacements combine a cementless stem with a cemented acetabular component (Table H15).

The large numbers of different prostheses used with cement and hybrid fixation have been detailed (Tables H12 & H14). The Exeter is the most common cemented stem, used in 41.4% of primary cemented total hips and 41.9% of primary hybrid total hip replacements. Overall 33 different cemented stems have been recorded. There is also considerable variation in the combination of femoral stems with different acetabular components. This is well demonstrated with the Exeter stem, which has been used with 11 cemented and 16 cementless acetabular components.

The tendency for a large number of different components being used is also demonstrated with primary cementless total hip replacement. In this group, 50 cementless femoral stems have been recorded. These have been used in combination with 40 different types of acetabular components. Data on the most commonly used stems are presented in Table H13.

Over the last twelve months there has been a marked increase in the use of resurfacing hip replacements with the incidence changing from 2.3% to 4.8% of all primary total hip replacements (Table H16).

Most Commonly Used Prostheses

The top ten tables are an amalgamation of cemented, cementless, and hybrid primary total hips that are subdivided into the various categories listed. The top ten tables indicate that the Exeter is the most used stem. Resurfacing hip replacement has increased to be the fourth most common cemented prosthesis (Table H17). Cementless stem use is not dominated by any one component (Table H18). The two most common acetabular components are the Trident and Vitalock cementless acetabular components (Table H20). There are eight cementless acetabular components that are used more frequently than the most common cemented acetabular component. The top three cemented acetabular components comprise almost 60% of the total used in this group (Table H19). There is considerable variability in the number of cementless acetabular components used.

Prosthesis Usage and Fixation for Revision Hip Replacement

Revision surgery has been divided into major and minor revisions. A major revision is defined as a procedure where a major component has been used. A major component is a component that interfaces with bone. Insertion of a stem is a major revision. The same applies to an acetabular cup or shell. The insertion of a femoral head or acetabular insert however is a minor revision, as these do not interface with bone.

Of the 3086 revisions, there were 2706 major revisions and 380 minor revisions (12.3%) (Tables H21 & H22). Of the major revisions femoral and acetabular components were revised in 1117 cases (41.3%). The acetabular component only was revised in 908 (33.6%) (Table H21). A small number of major revisions used a bipolar prosthesis: 36 (1.3%), (Table H24 & H25). Cementless revisions were used in 1,431 (53.6%), cemented in 825 (30.9%), and hybrid combinations in 335 (12.5%). Prostheses were not inserted in 79 procedures (3.0%) (Table H23). Compared to the previous report, cementless fixation has increased. This is likely to reflect regional variation, which has the potential to impact as a consequence of the staged introduction of the Registry. As all hospitals involved in joint replacement around the country are now committed to providing information, subsequent reports will be an accurate reflection of the national distribution of prostheses used.

As with the primary total hip replacement a considerable variety of stem and acetabular combinations are also evident in revision surgery. The Exeter stem is the most commonly used revision stem for totally cemented (40.6%) and hybrid revision procedures (48.0%) (Tables H26 & H28, complete data not shown). The Exeter stem is used in 20.6% of all femoral revisions. The next most common stem is the cementless S-Rom, used in 11.3% of all femoral revisions. There is again a wide variety of acetabular components: Secur-Fit, Vitalock and Trilogy comprising 51.4% of components used (Table H28). This figure compares to 52.6% for the top six acetabular components used for primary cementless hip replacement (Table H20).

A large number of components are recorded for minor revision (Table H30). Although it is possible to identify some or all of the original pre-revision hip replacement prostheses from these minor components, it is not possible to determine the proportion revised for these prostheses. This is because most of the pre-revision procedures were undertaken prior to the Registry collecting data and as a consequence the date of the original surgery and the total number of the prostheses used is unknown. As time progresses, an increasing proportion of pre-revision operations will be recorded and the revision rates can then be determined.

Bilateral Hip Replacement

When bilateral total hip replacements are undertaken, 10.1% are performed on the same day. Of the remainder, 85.7% are performed after six weeks. There are only a small number of bilateral procedures between these two periods (Table H31).

Registry Recorded Primary to Revision Hip Replacements

This section of the report deals with revision surgery that has been undertaken on hip replacement procedures previously recorded in the Registry database. Revision of 81 partial hip replacements and 163 primary total hip replacements recorded in the Registry are shown in Table H32.

In revision of primary partial hip replacements (Table H32), the unipolar monoblock prostheses were revised more frequently. The proportion of Austin-Moore prostheses revised is 2.6%. This compares to 0.3% for the cemented Thompson prosthesis. When a Thompson prosthesis is used in a cementless manner, the proportion revised is 3.9% (Table H37). The proportion of cementless Austin Moore prostheses being revised has increased since the last report from 1.1% to 2.6%. It appears at this early stage that cement fixation may be associated with reduced rates of revision when partial hip replacements are used. Longer Registry follow up will be necessary to clarify this situation.

The proportion revised for the unipolar modular prosthesis is 1.6% (Table H40) and for the bipolar prosthesis 1.9% (Table H35). In the primary bipolar procedures requiring revision (Table H35), the proportion revised of the Omnifit/UHR combination was 8.2% compared with the Exeter/UHR combination of 0.6%. This difference was noted in the last report. Statistically, there is a significant difference between the Omnifit/UHR combination when compared to the UHR with other stems. The log-rank test of difference in survival obtained a P

value of 0.004 and hazard ratio = 12.9, 95% Confidence Interval (CI) (1.5,112.9) adjusted for age. The confidence interval is wide. None of the Omnifit/UHR revisions were undertaken for infection. The reason the performance of the UHR appears reduced when in combination with the Omnifit stem, remains to be determined.

Of the 54 Austin Moore prostheses revised, 14 were converted to bipolar systems (with eight combinations of prostheses); five were converted to unipolar modular systems; 30 to total hip replacement; and three were revised with monoblock unipolar prostheses. One was removed for infection and one was a minor revision (cable) (TableH38).

Two cementless Thompson types were revised: one to a total hip replacement and one was managed with a cement spacer for infection. Two cemented Thompsons were revised: one to a bipolar, and one to a total hip replacement (Table H38).

Bipolar prostheses were revised with acetabular component alone in ten patients, one with a femoral component only and six were revised with another bipolar head. In three of these, the femoral component was revised (Table H36). Three of six patients with unipolar modular prostheses, only required revision with an acetabular component, an indication of the ease of revision with this type of primary prosthesis.

The proportion revised for Registry recorded primary total hip replacement is 1.0%, and for resurfacing 1.1%. Five of eight resurfacing prostheses revisions were for femoral neck fractures. Although the numbers are small, there have been no revisions of the thrust plate (Table H32).

The diagnosis for revision of Registry recorded primary hips is shown in Table H33. Dislocation was the principal diagnosis in 33.9% and infection in 8.6%. Revision for infection does not represent the infection rate, but rather the number of revisions being undertaken for infection.

The types of primary total hip replacements revised are shown in Tables H41-H44. The proportion revised for primary cemented hip replacements is 0.7%, compared with 1.2% for primary cementless hips, and 1.1% for hybrids. The 14.8% revision of Registry recorded Inter-Op acetabular component as of the 31st December 2001 reflects the previously well identified failure of this particular prostheses (Table H42).

Zirconia Femoral Heads

In the 2001 Registry report, the recall of Zirconia femoral heads was reported. To date the Registry has recorded one Zirconia femoral head fracture. Approximately 9000 of these prostheses were implanted in Australia. The Registry will continue to monitor these components.

Revision to Revision

There are 177 (6.1%) revisions of the 2909 previously recorded revision procedures (data not shown). A number of these revisions were multiple revisions, varying from two to four operations in some cases. Dislocation is the most common reason for a revision of a revision hip replacement. It was the principal diagnosis on 66 (33.8%) occasions with 18 occurring in the first 6 weeks. Infection was the next most common diagnosis (31.3%), followed by loosening in 42 (21.5%).

Femoral Head Size, Demographics and Relationship to Revision for Dislocation

This is the first occasion that the Registry has reported on femoral head size. There was much discussion about how much and how best to present this data. It was felt necessary to define the use of the different head sizes for both partial and primary hip replacements. In addition we have examined the relationship of femoral head size of primary total hips to subsequent revision for dislocation.

The data for femoral head size for primary partial unipolar (monoblock & modular) hip replacements and the outer diameter of bipolar hips are presented in two separate graphs (Graphs H4 & H5). These have been separated according to gender. The purpose of presenting this data is to provide information on the most common sizes used.

Head size for conventional primary total hip as well as resurfacing and thrust plate prostheses is also presented. The most used femoral head size for conventional primary total hips is 28mm (60.1%). The next most common is 26mm (21.2%). The smaller '22mm' femoral head is used in less than 10% of conventional primary total hip replacements (Table H47).

Last year the Registry reported that dislocation was the most common reason for early revision following hip replacement. Due to the increased numbers this year, it has been possible to begin examining the relationship between the size of the femoral head used in primary total hips and the subsequent likelihood of revision for dislocation. It is important to emphasise that it has been well established that the risk of dislocation following primary total hip replacement is influenced by many factors. Specifically this analysis has not taken into account factors such as diagnosis, operative approach, associated co-morbidities, surgeon experience etc. The results however do appear to suggest that there is a direct relationship between the size of the femoral head and the likelihood of undergoing revision for dislocation. The larger the femoral head the smaller the chance of revision for dislocation. The risk is highest with the 22mm head. The current registry figures indicate that the risk is not reduced by increasing to 26mm. The reduced risk with increasing size does not begin to become evident until 28mm (Table H48). There have been no revisions for dislocation in the resurfacing hip systems or the thrust plates.

Hip Replacement - 1/9/1999 to 31/12/2001

Table H1: Number of Hip Replacements by sex

Type of hip replacement	*Female*		*Male*		*Total*	
	Number	*%*	*Number*	*%*	*Number*	*%*
Primary Partial Hip	3001	13.2	995	4.4	3996	17.6
Primary Total Hip	8226	36.2	7415	32.6	15641	68.8
Revision Hip	1664	7.3	1422	6.3	3086	13.6
Total	**12891**	**56.7**	**9832**	**43.3**	**22723**	**100.0**

Note: *percents shown are of 22723*

Definitions
Partial: *includes either unipolar or bipolar hip replacement*
Primary total: *primary total hip replacement, resurfacing and thrust plate procedures*
Revision: *re-operation for exchange or removal of one or more components*

Demographic characteristics of patients undergoing Hip Replacement - 1/9/1999 to 31/12/2001

Table H2: Summary statistics of age (by sex) for All Hip Replacements

	Female *N= 12891 (56.7%)*	***Male*** *N= 9832 (43.3%)*	***All Patients*** *N= 22723 (100.0%)*
Median	75	70	73
Minimum	16	17	16
Maximum	105	103	105
Mean	73.0	68.3	71.0
Standard Deviation	12.4	12.4	12.6

Table H3: Summary statistics of age (by sex) for Primary Partial Hip Replacement

	Female *N= 3001 (75.1%)*	***Male*** *N= 995 (24.9%)*	***All Patients*** *N= 3996 (100.0%)*
Median	83	82	83
Minimum	23	37	23
Maximum	105	103	105
Mean	82.5	81.3	82.2
Standard Deviation	8.5	9.0	8.6

Graph H1: Age and Sex - Partial Hip Replacement

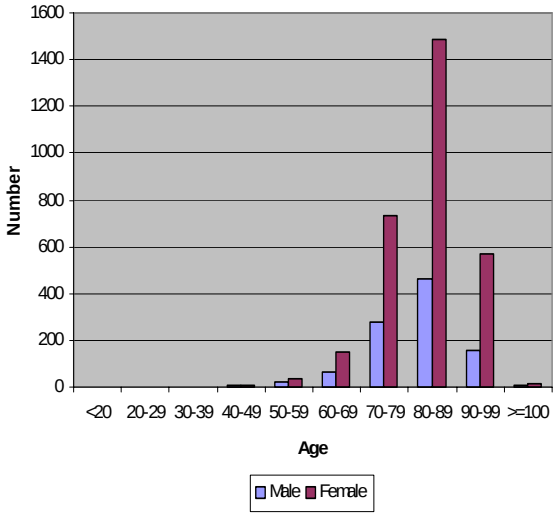


Table H4: Summary statistics of age (by sex) for Primary Total Hip Replacement

	Female *N= 8226 (52.6%)*	***Male*** *N= 7415 (47.4%)*	***All Patients*** *N= 15641 (100.0%)*
Median	71	67	69
Minimum	16	17	16
Maximum	98	100	100
Mean	69.6	66.1	67.9
Standard Deviation	11.9	11.7	11.9

Graph H2: Age and Sex - Primary Hip Replacement

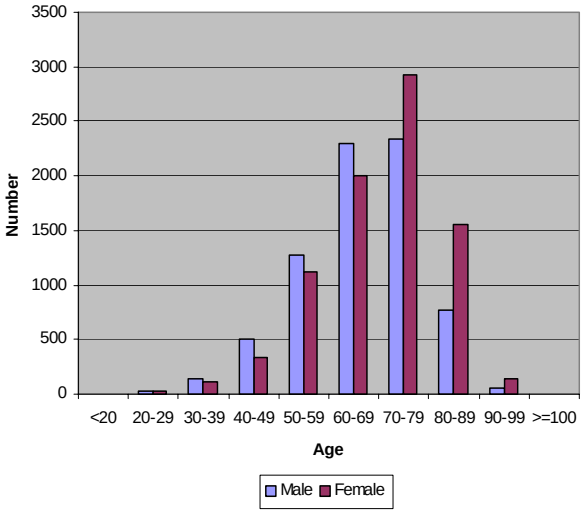
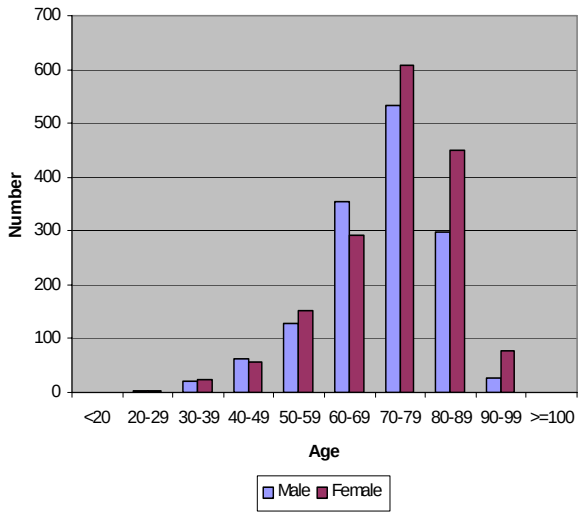


Table H5: Summary statistics of age (by sex) for Revision Hip Replacement

	Female *N= 1664 (53.9%)*	***Male*** *N=1422 (46.1%)*	***All Patients*** *N= 3086 (100.0%)*
Median	75	73	74
Minimum	24	25	24
Maximum	102	96	102
Mean	72.8	70.9	71.9
Standard Deviation	12.2	11.6	12.0

Graph H3: Age and Sex - Revision Hip Replacement



Diagnosis for Hip Replacement - 1/9/1999 to 31/12/2001

Table H6: Principal Diagnosis - Partial Hip Replacement

Principal Diagnosis	*Number*	*%**
Fractured Neck Of Femur	3777	94.5
Osteoarthritis	116	2.9
Tumour	56	1.4
Avascular Necrosis	24	0.6
Failed Internal Fixation	14	0.4
Developmental Dysplasia	7	0.2
Rheumatoid Arthritis	2	0.1
Total	**3996**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table H7: Principal Diagnosis - Primary Total Hip Replacement

Principal Diagnosis	*Number*	*%**
Osteoarthritis	13711	87.7
Avascular Necrosis	728	4.7
Fractured Neck Of Femur	386	2.5
Rheumatoid Arthritis	311	2.0
Developmental Dysplasia	253	1.6
Other Inflammatory Arthritis	102	0.7
Tumour	84	0.5
Failed Internal Fixation	35	0.2
Arthrodesis Takedown	10	0.1
Fracture/Dislocation	10	0.1
Other	11	0.1
Total	**15641**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table H8: Diagnosis - Revision Hip Replacement

Diagnosis	*Number*	*%*
Loosening	1896	52.4
Dislocation Of Prosthesis	490	13.5
Lysis	380	10.5
Fracture	264	7.3
Infection	246	6.8
Implant Breakage Acetabular	126	3.5
Wear Acetabulum	72	2.0
Pain	61	1.7
Implant Breakage Stem	30	0.8
Other	55	1.5
Total	**3620**	**100.0**

Note: *some patients had multiple diagnoses*

Prosthesis Fixation and Usage for Partial Hip Replacement - 1/9/1999 to 31/12/2001

Table H9: Prosthesis fixation - Partial Hip Replacement

Fixation	***Unipolar Monoblock***		***Unipolar Modular***		***Bipolar***		***All Patients***	
	Number	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*
Cemented	613	15.3	337	8.4	822	20.6	1772	44.3
Cementless	2129	53.3	28	0.7	67	1.7	2224	55.7
Total	**2742**	**68.6**	**365**	**9.1**	**889**	**22.2**	**3996**	**100.0**

Table H10: Prosthesis Usage - Partial Hip Replacement

	Unipolar Monoblock		***Number***	***%****
Cemented	Austin-Moore Type		27	1.0
	Thompson Type		586	21.4
Cementless	Austin-Moore Type		2078	75.8
	Thompson Type		51	1.9
Total			**2742**	**100.0**
	Unipolar Modular			
	Stem	*Unipolar Head*		
Cemented Stem	CCA	Hemi Head	103	28.2
	CPT	Unipolar Type *(Zimmer)*	68	18.6
	Spectron	Unipolar Head *(S&N)*	62	17.0
		Unitrax	6	1.6
	Exeter	Unitrax	46	12.6
	Other stems (8)	Other	50	14.2
Cementless Stem	Alloclassic	Unipolar Head *(Sulzer)*	18	4.9
		Unipolar Ballhead *(Sulzer)*	3	0.8
	Other Stems (6)	Other	7	2.1
Total			**365**	**100.0**
	Bipolar			
	Stem	*Bipolar Prosthesis*		
Cemented Stem	Exeter	Centrax	243	27.3
		UHR	170	19.1
		Hastings	6	0.7
		Convene	1	0.1
	Elite Plus	Hastings	92	10.3
		Depuy Endo Cup	2	0.2
		UHR	1	0.1
	Thompson Modular	Ultima	76	8.5
	Omnifit	UHR	70	7.9
		Centrax	4	0.4
	Other stems (16)	Other	157	17.4
Cementless Stem	Omnifit	UHR	3	0.3
	Versys	Depuy Endo Cup	1	0.1
		Bi-Polar Type *(Zimmer)*	1	0.1
	Mallory-Head	Centrax	11	1.2
		Bipolar Type *(Biomet)*	4	0.4
	Alloclassic	Bipolar Ballhead *(Sulzer)*	13	1.5
	Other stems (12)	Other	34	3.6
Total			**889**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name*
**entries do not equal 100% due to rounding*

Prosthesis Fixation and Usage for Primary Total Hip Replacement - 1/9/1999 to 31/12/2001

Table H11: Prosthesis Fixation - Primary Total Hip Replacement

Prosthesis Fixation	*Number*	*%*
Cemented	3324	21.3
Cementless	5991	38.3
Hybrid	5530	35.4
Other	796	5.1
Total	**15641**	**100.0**

Note: *other includes resurfacing and thrust plate systems*

Table H12: Prosthesis Usage - Primary Total Hip Replacement where both the Femoral and Acetabular components were Cemented

Femoral Component	*Acetabular Component*	*Number*	*%*
Exeter	Contemporary	657	19.8
	Exeter	590	17.7
	Elite Plus	88	2.6
	Other (8)	42	1.3
Charnley	Charnley	376	11.3
Spectron	Reflection	288	8.7
	Apollo	42	1.3
	Elite Plus	5	0.2
	Other (3)	6	0.2
Elite Plus	Charnley	168	5.1
	Elite Plus	102	3.1
	Apollo	24	0.7
	Other (3)	11	0.3
MS 30	Low Profile Cup	234	7.0
	Apollo	38	1.1
	Other (2)	4	0.2
C-Stem	Charnley	140	4.2
	Elite Plus	54	1.6
	Exeter	10	0.3
	Other (2)	7	0.2
CPT	ZCA	128	3.9
	Reflection	14	0.4
Omnifit	Omnifit	96	2.9
	Contemporary	45	1.4
	GAP	1	0.0
CCA	CCB Special Cup	43	1.3
	CCB	7	0.2
	Low Profile Cup	1	0.0
Versys	ZCA	17	0.5
	Elite Plus	8	0.2
Other Stems (13)		78	2.3
Total		**3324**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name*
**entries do not equal 100% due to rounding*
other (n) equals the number of other types of prostheses

Table H13: Prosthesis Usage - Primary Total Hip Replacement where the Femoral and Acetabular components were Cementless

Femoral Component	*Acetabular Component*	*Number*	*%**
Secur-Fit Plus	Trident	463	7.7
	Secur-Fit	39	0.7
	Omnifit	30	0.5
	Other (5)	6	0.1
Alloclassic	Allofit	230	3.8
	Fitmore	123	2.1
	Morscher	86	1.4
	Other (4)	89	1.5
Omnifit	Trident	260	4.3
	Secur-Fit	185	3.1
	Trilogy	16	0.3
	Other (2)	16	0.3
Synergy	Reflection	466	7.8
ABG II	ABG II	416	6.9
	Trident	29	0.5
	Vitalock	8	0.1
	Other (5)	5	0.1
Mallory-Head	Mallory-Head	451	7.5
Secur-Fit	Trident	296	4.9
	Secur-Fit	63	1.1
	Omnifit	42	0.7
	Other (1)	2	0.0
S-Rom	Option	147	2.5
	S-Rom	91	1.5
	Duraloc	55	0.9
	Other (10)	44	0.7
CLS	Fitmore	119	2.0
	CLS	115	1.9
	Allofit	31	0.5
	Other (5)	23	0.4
Versys	Trilogy	272	4.5
	Duraloc	12	0.2
	Trabecular Metal	1	0.0
Other Stems (40)		1760	29.4
Total		**5991**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name*
**entries do not equal 100% due to rounding*
other (n) equals the number of other types of prostheses

Table H14: Prosthesis Usage - Hybrid -Primary Total Hip Replacement where the Femoral component was Cemented and the Acetabular component was Cementless

Femoral Component	*Acetabular Component*	*Number*	*%**
Exeter	Vitalock	1151	21.0
	Trident	357	6.5
	ABG II	243	4.4
	Other (13)	481	8.8
Spectron	Reflection	631	11.5
	ABG II	23	0.4
	Secur-Fit	7	0.1
	Other (2)	3	0.1
Elite Plus	Duraloc	367	6.7
	Mallory-Head	71	1.3
	Trident	29	0.5
	Other (11)	64	1.2
Omnifit	Trident	240	4.4
	Secur-Fit	150	2.7
	Trilogy	12	0.2
	Other (3)	6	0.1
CPT	Trilogy	297	5.4
	S-Rom	32	0.6
	Reflection	8	0.1
Definition	Vitalock	218	4.0
	Trident	51	0.9
	ABG II	21	0.4
MS 30	Fitmore	128	2.3
	Allofit	56	1.0
	Trilogy	22	0.4
	Other (8)	33	0.6
Charnley	Vitalock	136	2.5
	Duraloc	63	1.1
C-Stem	Duraloc	136	2.5
	Reflection	6	0.1
	S-ROM	2	0.0
	Other	1	0.0
Freeman	Mallory-Head	125	2.3
Other Stems (18)		321	5.8
Total		**5491**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name*
**entries do not equal 100% due to rounding*
other (n) equals the number of other types of prostheses

Table H15: Prosthesis Usage - Hybrid - Primary Total Hip Replacement where the Femoral component was Cementless and the Acetabular component was Cemented

Femoral Component	*Acetabular Component*	*Number*	*%**
Friendly Hip	Mueller	13	33.3
Corail	Elite Plus	7	17.9
Alloclassic	Apollo	2	5.1
	Other (4)	4	10.2
S-Rom	CCB	1	2.6
	Charnley	1	2.6
	Elite Plus	1	2.6
Secur-Fit	Contemporary	2	5.1
	Omnifit	1	2.6
CLS	Apollo	1	2.6
	Low Profile Cup	1	2.6
Natural Hip	Apollo	1	2.6
	Low Profile Cup	1	2.6
HMRS	Contemporary	1	2.6
Mallory-Head	Mallory-Head	1	2.6
Synergy	Exeter	1	2.6
Total		**39**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name*
**entries do not equal 100% due to rounding*
other (n) equals the number of other types of prostheses

Table H16: Other types of Primary Hip Replacements

Resurfacing Head	*Cup*	*Number*	*%**
BHR	BHR	729	96.3
Conserve	-	2	0.3
Conserve Plus	Conserve Plus	5	0.7
Cormet 2000	Cormet 2000	21	2.8
Total Resurfacing		**757**	**100.0**

Note: **entries do not equal 100% due to rounding*

Thrust Plate	*Shell/Cup*		
DSP	Fitmore	32	82.1
DSP	Artek	5	12.8
DSP	Allofit	2	5.1
Total Thrust Plate		**39**	**100.0**

Top Ten Femoral and Acetabular Components used for Primary Total Hip Replacement - 1/9/1999 to 31/12/2001

Table H17: Top Ten Cemented Stems used in Primary Total Hip Replacement

Cemented Stems	*Number*	*%*
Exeter	3609	37.8
Spectron	1005	10.5
Elite Plus	836	8.8
BHR	729	7.6
Charnley	575	6.0
Omnifit	550	5.8
MS 30	515	5.4
CPT	479	5.0
C-Stem	356	3.7
Definition	309	3.2
Other	588	6.2
Total	**9551**	**100.0**

Table H18: Top Ten Cementless Stems used in Primary Total Hip Replacement

Cementless Stems	*Number*	*%**
Secur-Fit Plus	538	8.8
Alloclassic	534	8.8
Omnifit	477	7.8
Synergy	467	7.7
ABG II	458	7.5
Mallory-Head	452	7.4
Secur-Fit	406	6.7
S-Rom	340	5.6
CLS	290	4.8
Versys	285	4.7
Other	1843	30.3
Total	**6090**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table H19: Top Ten Cemented Acetabular components used in Primary Total Hip Replacement

Cemented Acetabular	*Number*	*%*
Contemporary	723	21.5
Charnley	689	20.5
Exeter	603	17.9
Reflection	313	9.3
Elite Plus	266	7.9
Low Profile Cup	243	7.2
ZCA	145	4.3
Apollo	131	3.9
Omnifit	102	3.0
CCB Special Cup	59	1.8
Other	89	2.6
Total	**3363**	**100.0**

Table H20: Top Ten Cementless Acetabular components used in Primary Total Hip Replacement

Cementless Acetabular	*Number*	*%*
Trident	1863	15.2
Vitalock	1780	14.5
Reflection	1243	10.1
Mallory-Head	1062	8.6
Duraloc	1004	8.2
ABG II	810	6.6
Trilogy	806	6.6
BHR	729	5.9
Secur-Fit	575	4.7
Fitmore	546	4.4
Other	1860	15.1
Total	**12278**	**100.0**

Prosthesis Fixation and Usage for Revision Hip Replacement - 1/9/1999 to 31/12/2001

Table H21: Components Used - Major Revision Hip

Component Used	*Number*	*%*
Femoral and Acetabular	1117	41.3
Acetabular Component Only	908	33.6
Femoral Component Only	566	20.9
Cement Spacer	44	1.6
Bipolar head and stem	36	1.3
Removal of Prosthesis	35	1.3
Total	**2706**	**100.0**

Table H22: Components Used - Minor Revision Hip

Component Used	*Number*	*%**
Head/Insert	280	73.7
Head Only	49	12.9
Cable/Other Minor Components	28	7.4
Insert only	20	5.3
Bipolar Head Only	3	0.8
Total	**380**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table H23: Prosthesis Fixation - Major Revision Hip Replacement

Component Used	*Cementless*		*Cemented*		*Hybrid*		*N/A*		*Total*	
	Number	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*
Femoral Only	355	13.3	211	7.9	-	-	-	-	566	21.2
Acetabular Only	605	22.7	303	11.3	-	-	-	.	908	34.0
Femoral and Acetabular	471	17.6	311	11.6	335	12.5	-	-	1117	41.8
Prostheses not reinserted	-	-	-	-	-	-	79	3.0	79	3.0
Total	**1431**	**53.6**	**825**	**30.9**	**335**	**12.5**	**79**	**3.0**	**2670**	**100.0**

Note: *N/A means not applicable. No hip component was used.*

Table H24: Prosthesis Fixation - Bipolar - Major Revision Hip Replacement

Component Used	*Cementless Stem*		*Cemented Stem*		*Total*	
	Number	*%*	*Number*	*%*	*Number*	*%*
Bipolar head and Stem	9	25.0	27	75.0	36	100.0
Total	**9**	**25.0**	**27**	**75.0**	**36**	**100.0**

Table H25: Prosthesis Usage - Bipolar - Major Revision Hip Replacement

Femoral Component	*Bipolar*	*Number*	*%**
Exeter	Centrax	14	38.9
	UHR	6	16.7
Omnifit	Centrax	1	2.8
	UHR	2	5.6
Mallory-Head	Centrax	1	2.8
	Bipolar Type *(Biomet)*	1	2.8
ZMR	Bi-Polar Type *(Zimmer)*	2	5.6
S-Rom	Hastings	2	5.6
Charnley	Hastings	2	5.6
Definition	Centrax	1	2.8
PCA	UHR	1	2.8
Alloclassic	Bipolar Ballhead *(Sulzer)*	1	2.8
PFM-R	Bipolar Ballhead *(Sulzer)*	1	2.8
CPT	Hastings	1	2.8
Total		**36**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name*
**entries do not equal 100% due to rounding*

Table H26: Prosthesis Usage - Cemented Major Revision Hip Replacement

Type of revision	*Femoral Component*	*Acetabular Component*	*Number*	*%*
Femoral only	Exeter	-	72	8.7
	Elite Plus	-	30	3.6
	Spectron	-	19	2.3
	Charnley	-	16	1.9
	CPT	-	15	1.8
	Other	-	59	7.2
Acetabular only	-	Contemporary	48	5.8
	-	Reflection	47	5.7
	-	Exeter	38	4.6
	-	Charnley	35	4.2
	-	Elite Plus	31	3.8
	-	Other	104	12.6
Femoral & Acetabular	Exeter	Contemporary	74	9.0
	Exeter	Exeter	55	6.7
	Charnley	Charnley	19	2.3
	Spectron	Reflection	14	1.7
	Elite Plus	Elite Plus	12	1.5
	Other	Other	137	16.6
Total			**825**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name - equals no component exchanged*

Table H27: Prosthesis Usage - Cementless Major Revision Hip Replacement

Type of revision	*Femoral Component*	*Acetabular Component*	*Number*	*%**
Femoral only	S-Rom	-	73	5.1
	Solution	-	46	3.2
	ZMR	-	46	3.2
	Restoration	-	45	3.1
	PFM-R	-	25	1.7
	Other	-	120	8.4
Acetabular only	-	Secur-Fit	131	9.2
	-	Mallory-Head	70	4.9
	-	Trident	66	4.6
	-	Vitalock	60	4.2
	-	Reflection	56	3.9
	-	Other	222	15.5
Femoral &	ZMR	Trilogy	48	3.4
Acetabular	Restoration	Trident	46	3.2
	Mallory-Head	Mallory-Head	33	2.3
	Echelon	Reflection	26	1.8
	Revision Hip	SPH	26	1.8
	Other	Other	292	20.4
Total			**1431**	**100.0**

Note: *femoral model name not repeated but usage continues down the column until change of model name - equals no component exchanged, *entries do not equal 100% due to rounding*

Table H28: Prosthesis Usage - Hybrid (stem cemented) Major Revision Hip Replacement

Type of revision	*Femoral Component*	*Acetabular Component*	*Number*	*%**
Femoral &	Exeter	Vitalock	48	18.2
Acetabular	Exeter	Secur-Fit	29	11.0
	CPT	Trilogy	22	8.3
	Spectron	Reflection	20	7.6
	Exeter	Trident	14	5.3
	Other	Other	131	49.6
Total			**264**	**100.0**

Table H29: Prosthesis Usage - Hybrid (cup cemented) Major Revision Hip Replacement

Type of revision	*Femoral Component*	*Acetabular Component*	*Number*	*%**
Femoral &	Revision Hip	Exeter	5	7.0
Acetabular	Mallory-Head	Contemporary	4	5.6
	S-Rom	Contemporary	4	5.6
	PFM-R	Apollo	3	4.2
	Restoration	Omnifit	3	4.2
	Other	Other	52	73.2
Total	Total		**71**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table H30: Prosthesis Usage - Minor component exchange Revision Hip Replacement Ten Most common exchanged Inserts

Liner	*Number*	*%*
HGP II	47	15.7
Omnifit	34	11.3
Constrained Insert (Osteonics)	33	11.0
PCA	31	10.3
Reflection	20	6.7
Duraloc	18	6.0
Mallory-Head	18	6.0
Vitalock	18	6.0
Ringloc	17	5.7
Longevity	15	5.0
Other	49	16.3
Total	**300**	**100.0**

Bilateral Hip Replacement - 1/9/1999 to 31/12/2001

Table H31: Days between procedures for Bilateral Primary Hips

1st Procedure	*2nd Procedure*	*Days between Bilateral Procedures*											
		Same Day		*<2 weeks*		*2-6 weeks*		*6 weeks - 6 months*		*>6 months*		***Total***	
		N	*%**	*N*	*%*	*N*	*%*	*N*	*%**	*N*	*%**	*N*	*%**
Bipolar	Bipolar	1	0.1	-	-	-	-	2	0.3	3	0.4	6	0.9
	Unipolar Modular	-	-	-	-	-	-	-	-	1	0.1	1	0.1
	Total Hip	-	-	-	-	-	-	-	-	3	0.4	3	0.4
Unipolar Mono	Unipolar Mono	2	0.3	4	0.6	3	0.4	16	2.4	6	0.9	31	4.6
	Unipolar Modular	-	-	-	-	-	-	1	0.1	-	-	1	0.1
	Total Hip	-	-	-	-	-	-	2	0.3	-	-	2	0.3
Unipolar Modular	Bipolar	-	-	-	-	-	-	2	0.3	-	-	2	0.3
	Unipolar Modular	-	-	-	-	-	-	1	0.1	1	0.1	2	0.3
Resurfacing	Resurfacing	17	2.5	1	0.1	-	-	17	2.5	9	1.3	44	6.6
Thrust Plate	Thrust Plate	-	-	-	-	-	-	1	0.1	-	-	1	0.1
Total Hip	Bipolar	1	0.1	-	-	-	-	1	0.1	-	-	2	0.3
	Unipolar Mono	-	-	-	-	-	-	1	0.1	1	0.1	2	0.3
	Resurfacing	1	0.1	-	-	-	-	.	.	1	0.1	2	0.3
	Total Hip	46	6.9	10	1.5	10	1.5	277	41.3	229	34.1	572	85.2
Total		**68**	**10.1**	**15**	**2.2**	**13**	**1.9**	**321**	**47.8**	**254**	**37.9**	**671**	**100.0**

Note: **entries do not equal total due to rounding*

Registry Recorded Primary to Revision Hip Replacement -

1/9/1999 to 31/12/2001

Table H32: Days to Revision by Primary procedure type

Primary Procedure (N)		***Days to Revision Procedure***										***Total***		***% revised***
		Same Day		*<2 weeks*		*2-6 weeks*		*6 weeks - 1 year*		*>1 year*				
		N	*%*	*N*	*%**	*N*	*%**	*N*	*%**	*N*	*%*	*N*	*%**	*%*
Bipolar	(889)	-	-	3	1.2	4	1.6	8	3.3	2	0.8	17	7.0	1.9
Unipolar Monoblock	(2742)	1	0.4	5	2.0	12	4.9	35	14.3	5	2.0	58	23.8	2.1
Unipolar Modular	(365)	-	-	1	0.4	2	0.8	3	1.2	-	-	6	2.5	1.6
Total Hip	(14845)	3	1.2	29	11.9	29	11.9	87	35.7	7	2.9	155	63.5	1.0
Resurfacing Hip	(757)	-	-	1	0.4	1	0.4	5	2.0	1	0.4	8	3.3	1.1
Thrust Plate	(39)	-	-	-	-	-	-	-	-	-	-	0	0.0	0.0
Total	**(19637)**	**4**	**1.6**	**39**	**16.0**	**48**	**19.7**	**138**	**56.6**	**15**	**6.1**	**244**	**100.0**	**1.2**

Note: **entries do not equal total due to rounding*

Table H33: Days to Revision by Revision Diagnosis

Diagnosis	***Days to Revision Procedure***										***Total***	
	Same Day		*<2 weeks*		*2-6 weeks*		*6 weeks - 1 year*		*>1 year*			
	N	*%*	*N*	*%**	*N*	*%*	*N*	*%**	*N*	*%*	*N*	*%*
Dislocation	2	0.8	18	7.0	25	9.7	37	14.4	5	1.9	87	33.9
Fracture	1	0.4	9	3.5	12	4.7	22	8.6	2	0.8	46	17.9
Implant Breakage Acetabular	-	-	-	-	-	-	1	0.4	-	-	1	0.4
Implant Breakage Stem	-	-	1	0.4	-	-	2	0.8	-	-	3	1.2
Infection	-	-	-	-	3	1.2	18	7.0	1	0.4	22	8.6
Loosening	-	-	8	3.1	9	3.5	56	21.8	5	1.9	78	30.4
Lysis	-	-	-	-	1	0.4	5	1.9	1	0.4	7	2.7
Pain	-	-	-	-	-	-	1	0.4	2	0.8	3	1.2
Other	1	0.4	5	1.9	-	-	4	1.6	-	-	10	3.9
Total	**4**	**1.6**	**41**	**16.0**	**50**	**19.5**	**146**	**56.8**	**16**	**6.2**	**257**	**100**

Note: **entries do not equal total due to rounding*
Revision procedures may have more than one diagnosis

Table H34: Primary to Revision procedure types

Primary	*Revision*	*Number*	*%**
Bipolar	Femoral Component Only	1	0.4
	Acetabular Comp Only	10	4.1
	Removal Prosthesis	1	0.4
	Bipolar head and stem	3	1.2
	Bipolar Head Only	2	0.8
Unipolar Monoblock	Femoral Component Only	9	3.7
	Femoral and Acetabular	32	13.1
	Removal Prosthesis	1	0.4
	Cement Spacer	1	0.4
	Bipolar head and stem	14	5.7
	Cable/Other Minor	1	0.4
Unipolar Modular	Femoral Component Only	1	0.4
	Acetabular Comp Only	3	1.2
	Femoral and Acetabular	1	0.4
	Removal Prosthesis	1	0.4
Total Hip	Femoral Component Only	37	15.2
	Acetabular Comp Only	57	23.4
	Femoral and Acetabular	11	4.5
	Removal Prosthesis	2	0.8
	Cement Spacer	2	0.8
	Head/Insert	29	11.9
	Insert only	2	0.8
	Head Only	13	5.3
	Cable/Other Minor	2	0.8
Resurfacing Hip Sys	Femoral Component Only	4	1.6
	Femoral and Acetabular	4	1.6
Total		**244**	**100.0**

Note: *model type not repeated but continues down the column until change of model type*
**entries do not equal 100% due to rounding*

Components used in the Primary Procedures that were Revised

Table H35: Primary Bipolar Procedures requiring Revision

Femoral Component	*Bipolar*	*Number Revised*	*Total Number*	*% of Total Revised*
Omnifit	UHR	6	73	8.2
Exeter	UHR	1	170	0.6
	Centrax	4	243	1.6
Elite Plus	Hastings	1	92	1.1
Thompson Modular	Ultima	0	76	0.0
Others	-	5	235	2.1
Total		**17**	**889†**	**1.9**

Note: *femoral model name not repeated but usage continues down the column until change of model name,*
†total number equals total primary bipolar procedures

Table H36: Components Used - Primary Bipolar to Revision

Primary Procedure		*Revision Procedure*			*N*	*%**
Femoral Component	*Bipolar Head*	*Femoral Component*	*Bipolar Head*	*Acetabular Component*		
Bi-Metric	Bipolar *(Biomet)*	N/R	-	Mallory-Head	1	5.9
Definition	Centrax	N/R	-	Secur-Fit	1	5.9
Elite Plus	Hastings	N/R	-	Trident	1	5.9
Exeter	Centrax	N/R	-	Secur-Fit	1	5.9
		N/R	-	Trident	1	5.9
		N/R	-	Brunswick	1	5.9
Omnifit	UHR	N/R	-	Secur-Fit	2	11.8
		N/R	-	Trident	1	5.9
		N/R	-	Brunswick	1	5.9
Omnifit	UHR	Omnifit	-	-	1	5.9
Omnifit	UHR	Omnifit	UHR	-	1	5.9
Mallory-Head	Bipolar *(Biomet)*	Mallory-Head	Bipolar *(Biomet)*	-	1	5.9
Taperloc	Bipolar *(Biomet)*	ZMR	Bi-Polar *(Zimmer)*	-	1	5.9
Exeter	Centrax	N/R	Centrax	-	1	5.9
	UHR	N/R	UHR	-	1	5.9
C-Stem	Hastings	N/R	UHR	-	1	5.9
Total					**17**	**100.0**

Note: *model name not repeated but continues down the column until change of model name*
- *equals no component used,* **entries do not equal 100% due to rounding*
- *N/R equals not revised*

Table H37: Primary Unipolar Monoblock Procedure requiring Revision

Unipolar Monoblock	***Number Revised***	***Total Number***	***% of Total Revised***
Austin-Moore Type	54	2105	2.6
Thompson Type	4	637	0.6
Total	**58**	**2742**†	**2.1**

Note: †*total number equals total unipolar monoblock*

Table H38: Components Used - Primary Unipolar Monoblock to Revision

Primary Procedure	***Revision Procedure***					***N***	***%****
Unipolar Monoblock	*Revision Type*	*Femoral Component*	*Acetabular Component*	*Unipolar Head*	*Bipolar Head*		
Austin-Moore	Bipolar/ Stem	Alloclassic	-	-	Ballhead *(Sulzer)*	1	1.7
cementless		CPT	-	-	Hastings	1	1.7
		Exeter	-	-	Centrax	4	6.9
					UHR	2	3.4
		PCA	-	-	UHR	1	1.7
		PFM-R	-	-	Ballhead *(Sulzer)*	1	1.7
		S-Rom	-	-	Hastings	2	3.4
		ZMR	-	-	Bi-Polar *(Zimmer)*	1	1.7
		Spectron	-	-	Convene	1	1.7
	Femoral Only	Austin-Moore	-	-	-	2	3.4
		Omnifit	-	Unitrax	-	1	1.7
		Spectron		Unipolar*(S&N)*	-	4	6.9
		Thompson	-	-	-	1	1.7
	Femoral &	C-Stem	Elite Plus	-	-	1	1.7
	Acetabular	CPT	Trilogy	-	-	2	3.4
		Exeter	Elite Plus	-	-	1	1.7
			Trilogy	-	-	1	1.7
			Contemporary	-	-	6	10.3
			Exeter	-	-	1	1.7
			Trident	-	-	1	1.7
			Vitalock	-	-	2	3.4
		Mallory-Head	Mallory-Head	-	-	1	1.7
		Natural Hip	Apollo	-	-	1	1.7
		Omnifit	Trident	-	-	3	5.2
			Secur-Fit	-	-	2	3.4
		Restoration	Trident	-	-	1	1.7
		Spectron	Reflection	-	-	2	3.4
		Synergy	Reflection	-	-	1	1.7
		Versys	Trilogy	-	-	2	3.4
		ZMR	Trilogy	-	-	2	3.4
	R/O Prosthesis	-	-	-	-	1	1.7
	Cable/ Minor	-	-	-	-	1	1.7
Thompson	Femoral &	Revision Hip	SPH	-	-	1	1.7
cementless	Acetabular						
	Cement Spacer	N/R	-	-	-	1	1.7
cemented	Bipolar/Stem	Exeter	-	-	UHR	1	1.7
	Femoral & Acetabular	ZMR	Reflection	-	-	1	1.7
Total						**58**	**100.0**

Note: *model name not repeated but continues down the column until change of model name*

- *equals no component used,* **entries do not equal 100% due to rounding*
- *N/R equals Not Revised*

Table H39: Primary Unipolar Modular Procedures requiring Revision

Femoral Component	*Unipolar Head*	*Number Revised*	*Total Number*	*% of Total Revised*
Spectron	Unipolar Head *(S&N)*	2	63	3.2
CCA	Hemi Head	1	104	1.0
CPT	Unipolar *(Zimmer)*	1	68	1.5
Others		2	130	1.5
Total		**6**	**365**[†]	**1.6**

Note: *[†]total number equals total unipolar monoblock*

Table H40: Components Used - Primary Unipolar Modular to Revision

Primary Procedure		*Revision Procedure*			*N*	*%*[*]
Femoral Component	*Unipolar Head*	*Femoral Component*	*Acetabular Component*	*Unipolar Head*		
CCA	Hemi Head	N/R	Elite Plus	-	1	16.7
CPT	Unipolar *(Zimmer)*	CPT	Trilogy	-	1	16.7
Exeter	Unitrax	N/R	-	-	1	16.7
Omnifit	Unitrax	N/R	Secur-Fit	-	1	16.7
Spectron	Unipolar Head *(S&N)*	N/R	Reflection	-	1	16.7
		Spectron	-	Unipolar Head *(S&N)*	1	16.7
Total					**6**	**100.0**

Note: *model name not repeated but continues down the column until change of model name*
- *equals no component used, [*]entries do not equal 100% due to rounding*
- *N/R equals not revised*

Table H41: Primary Total where the Femoral and Acetabular components were Cemented requiring Revision

Femoral Component	*Acetabular Component*	*Number Revised*	*Total Number*	*% of Total Revised*
C-Stem	Charnley	2	140	1.4
Exeter	Contemporary	9	655	1.4
Omnifit	Omnifit	1	96	1.0
Exeter	Vitalock	1	99	1.0
Elite Plus	Elite Plus	1	102	1.0
Charnley	Charnley	3	376	0.8
CPT	ZCA	1	128	0.8
Exeter	Exeter	4	590	0.7
Elite Plus	Charnley	1	168	0.6
C-Stem	Elite Plus	0	54	0.0
Exeter	Elite Plus	0	88	0.0
MS 30	Low Profile Cup	0	233	0.0
Spectron	Reflection	0	327	0.0
Others		4	707	0.6
Total		**27**	**3763**	**0.7**

Note: *Some cementless components have been cemented*

Table H42: Primary Total where the Femoral and Acetabular components were Cementless requiring Revision

Femoral Component	*Acetabular Component*	*Number Revised*	*Total Number*	*% of Total Revised*
Natural HIp	Interop	4	21	19.0
Margron	Transcend	3	58	5.2
Alloclassic	Artek	2	58	3.4
Omnifit	Secur-Fit	5	185	2.7
Taperloc	Mallory-Head	2	94	2.1
Mallory-Head	Mallory-Head	8	448	1.8
ABG II	ABG II	7	416	1.7
Alloclassic	Fitmore	2	122	1.6
Secur-Fit	Secur-Fit	1	63	1.6
Versys	Trilogy	4	272	1.5
Alloclassic	Morscher	1	86	1.2
Synergy	Reflection	5	465	1.1
Meridian	Vitalock	1	96	1.0
Secur-Fit	Trident	3	295	1.0
F2l	SPH	1	101	1.0
Stability	Duraloc	1	113	0.9
Alloclassic	Allofit	2	230	0.9
Omnifit	Trident	2	259	0.8
Citation	Vitalock	1	141	0.7
S-Rom	Option	1	147	0.7
Secur-Fit Plus	Trident	1	462	0.2
CBC Stem	CBF Cup	0	76	0.0
Citation	Trident	0	58	0.0
CLS	CLS	0	115	0.0
CLS	Fitmore	0	114	0.0
Natural Hip	Fitmore	0	121	0.0
S-Rom	Duraloc	0	55	0.0
S-Rom	S-Rom	0	90	0.0
Unirom	Duraloc	0	51	0.0
Alloclassic	Inter-Op	0	6	0.0
Others		13	1084	1.2
Total		**70**	**5902**	**1.2**

Note: *Some cementless components have been cemented*

Table H43: Hybrid - Primary Total Hip where the Femoral component was Cemented and the Acetabular component was Cementless requiring Revision

Femoral Component	*Acetabular Component*	*Number Revised*	*Total Number*	*% of Total Revised*
C-Stem	Duraloc	4	130	3.1
Freeman	Mallory-Head	3	119	2.5
Exeter	Secur-Fit	2	80	2.5
Omnifit	Secur-Fit	3	142	2.1
MS 30	Allofit	1	51	2.0
Charnley	Duraloc	1	59	1.7
Elite Plus	Mallory-Head	1	64	1.6
Spectron	Reflection	9	592	1.5
Omnifit	Trident	3	230	1.3
Exeter	Vitalock	13	1052	1.2
Elite Plus	Duraloc	3	329	0.9
Charnley	Vitalock	1	126	0.8
CPT	Trilogy	2	270	0.7
Exeter	Mallory-Head	1	163	0.6
Exeter	ABG II	1	231	0.4
Exeter	Trident	1	330	0.3
Definition	Vitalock	0	202	0.0
Exeter	Duraloc	0	99	0.0
MS 30	Fitmore	0	123	0.0
Versys	Trilogy	0	103	0.0
Others		8	644	1.2
Total		**57**	**5139**	**1.1**

Note: *Some cementless components have been cemented*

Table H44: Hybrid - Primary Total Hip where the Femoral component was Cementless and the Acetabular was Cemented requiring Revision

Femoral Component	*Acetabular Component*	*Number Revised*	*Total Number*	*% of Total Revised*
Corail	Elite Plus	1	7	14.3
Others	-	0	34	0.0
Total		**1**	**41**	**2.4**

Note: *Some cementless components have been cemented*

Table H45: Components Used – Major - Primary Total Hip to Revision - Cemented, Cementless & Hybrid

Type of revision	***Primary Procedure***		***Revision Procedure***		***N***	***%****
	Femoral Component	*Acetabular Component*	*Femoral Component*	*Acetabular Component*		
Femoral Only	Exeter	Contemporary	Exeter	N/R	3	2.8
		Exeter	Exeter	N/R	1	0.9
			PFM-R	N/R	1	0.9
		Vitalock	Exeter	N/R	1	0.9
	ABG II	ABG II	ABG II	N/R	2	1.8
			Echelon	N/R	1	0.9
			S-Rom	N/R	1	0.9
	C-Stem	Duraloc	Solution	N/R	2	1.8
			S-Rom	N/R	1	0.9
		Charnley	C-Stem	N/R	1	0.9
	Margron	Transcend	Margron	N/R	2	1.8
		Interseal	Elite Plus	N/R	1	0.9
			Restoration	N/R	1	0.9
	Synergy	Reflection	ZMR	N/R	2	1.8
			Synergy	N/R	1	0.9
	Alloclassic	Allofit	Alloclassic	N/R	1	0.9
	Charnley	Charnley	Solution	N/R	1	0.9
			Elite Plus	N/R	1	0.9
	Corail	Elite Plus	Solution	N/R	1	0.9
	CPT	Trilogy	ZMR	N/R	1	0.9
	Elite Plus	Duraloc	CPT	N/R	1	0.9
	MBA	Option	Modular Neck	N/R	1	0.9
	Natural Hip	Allofit	Natural Hip	N/R	1	0.9
		Inter-Op	PFM-R	N/R	1	0.9
	Omnifit	Trident	Exeter	N/R	1	0.9
	S-Rom	Option	S-Rom	N/R	1	0.9
	Secur-Fit Plus	Trident	Secur-Fit Plus	N/R	1	0.9
		Omnifit	Omnifit	N/R	1	0.9
	Stability	Duraloc	Austin-Moore	N/R	1	0.9
	Taperloc	Mallory-Head	Mallory-Head	N/R	1	0.9
	Versys	Trilogy	Omnifit	N/R	1	0.9
Acetabular only	Exeter	Contemporary	N/R	Duraloc	1	0.9
		ABG II	N/R	Elite Plus	1	0.9
		Exeter	N/R	Exeter	1	0.9
		Vitalock	N/R	Secur-Fit	3	2.8
			N/R	Exeter	2	1.8
			N/R	Trilogy	1	0.9
			N/R	Ultima	1	0.9
			N/R	Vitalock	1	0.9
		Trident	N/R	Trident	1	0.9
			N/R	Bioclad	1	0.9
		Secur-Fit	N/R	Secur-Fit	1	0.9
			N/R	Trident	1	0.9
	ABG II	ABG II	N/R	ABG II	1	0.9
	C-Stem	Duraloc	N/R	Secur-Fit	1	0.9
	Margron	Transcend	N/R	Mallory-Head	1	0.9
	Synergy	Reflection	N/R	Reflection	1	0.9
	Alloclassic	Artek	N/R	Allofit	2	1.8
		Fitmore	N/R	Allofit	1	0.9
		Morscher	N/R	Allofit	1	0.9
	Elite Plus	Duraloc	N/R	Duraloc	1	0.9
		Reflection	N/R	Reflection	1	0.9

Table H45: continued

Type of revision	***Primary Procedure***		***Revision Procedure***		***N***	***%****
	Femoral Component	*Acetabular Component*	*Femoral Component*	*Acetabular Component*		
		Charnley	N/R	Brunswick	1	0.9
		Elite Plus	N/R	Elite Plus	1	0.9
	Natural Hip	Inter-Op	N/R	Allofit	1	0.9
			N/R	Fitmore	1	0.9
			N/R	Low Profile Cup *(M Inlay)*	1	0.9
		Artek	N/R	Inter-Op	1	0.9
	Omnifit	Trident	N/R	Secur-Fit	1	0.9
			N/R	Trident	2	1.8
		Omnifit	N/R	Secur-Fit	1	0.9
		Secur-Fit	N/R	Secur-Fit	1	0.9
			N/R	Vitalock	1	0.9
	Versys	Trilogy	N/R	Trilogy	1	0.9
	Mallory-Head	Mallory-Head	N/R	Mallory-Head	5	4.6
			N/R	Contemporary	1	0.9
	Spectron	ABG II	N/R	Elite Plus	1	0.9
		Reflection	N/R	Reflection	5	4.6
			N/R	Secur-Fit	2	1.8
			N/R	Brunswick	1	0.9
	Freeman	Mallory-Head	N/R	Mallory-Head	1	0.9
	Perfecta	Transcend	N/R	Lineage	1	0.9
	Perfecta Imc	Interseal	N/R	Secur-Fit	1	0.9
	Secur-Fit	Trident	N/R	Trident	1	0.9
Femoral & Acetabular	Exeter	Vitalock	Exeter	Vitalock	1	0.9
	Margron	Interseal	Margron	Interseal	1	0.9
	Alloclassic	Fitmore	Alloclassic	LOR	1	0.9
	Secur-Fit Plus	S-Rom	Secur-Fit Plus	S-Rom	1	0.9
	Mallory-Head	Mallory-Head	Spectron	Reflection	1	0.9
	Spectron	ABG II	Revision Hip	Elite Plus	1	0.9
		Reflection	Spectron	Reflection	1	0.9
	Secur-Fit	Trident	Secur-Fit	Secur-Fit	1	0.9
	Meridian	Vitalock	Definition	Contemporary	1	0.9
	MS 30	Apollo	MS 30	Apollo	1	0.9
	CPT	ZCA	CPT	ZCA	1	0.9
R/O Prosthesis	Exeter	Contemporary	-	-	2	1.8
	Elite Plus	Duraloc	Cement Spacer	-	1	0.9
	Omnifit	Secur-Fit	Cement Spacer	-	1	0.9
Total					**109**	**100.0**

Note: *model name not repeated but continues down the column until change of model name*
*- equals no component used, *entries do not equal 100% due to rounding, N/R equals Not Revised*

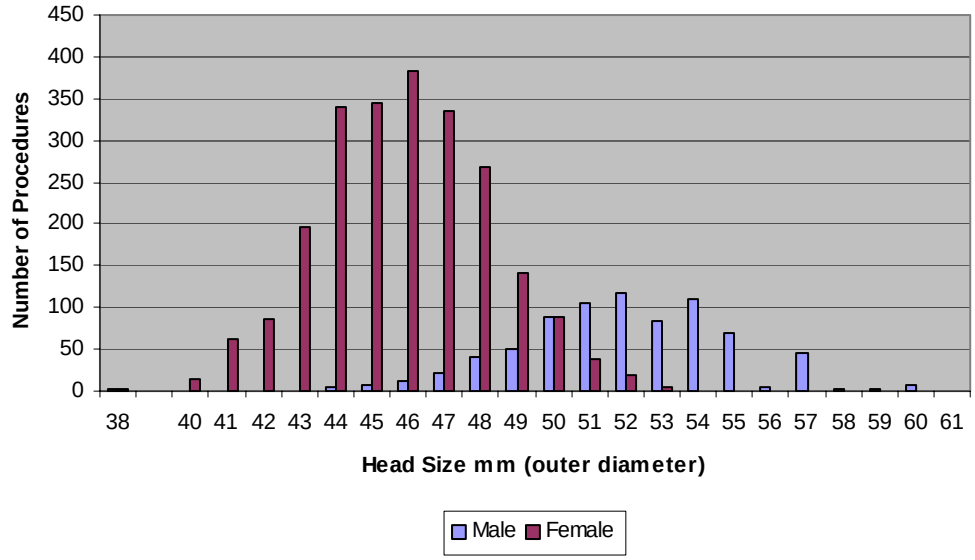
Table H46: Components Used – Minor - Primary Total Hip to Revision - Cemented, Cementless & Hybrid

Type of revision	***Primary Procedure***		***Revision Procedure***		***N***	***%****
	Femoral Component	*Acetabular Component*	*Head*	*Insert*		
Head/Insert	Omnifit	Secur-Fit	C-Taper	Constrained	3	6.5
				Omnifit	2	4.3
		Trident	C-Taper	Trident	1	2.2
	Freeman	Mallory-Head	Modular *(Corin)*	Ringloc	2	4.3
	Alloclassic	Allofit	Metasul *Ballhead*	Armor	1	2.2
	Charnley	Duraloc	Elite Modular	Duraloc	1	2.2
	Citation	Vitalock	V40	Vitalock	1	2.2
	CPT	Trilogy	CPT	Longevity	1	2.2
				Trilogy	1	2.2
	Elite Plus	Mallory-Head	Elite Modular	Mallory-Head	1	2.2
		Duraloc	Elite Modular	Duraloc	1	2.2
		S-Rom	Elite Modular	S-Rom	1	2.2
	Exeter	Mallory-Head	Exeter	Ringloc	1	2.2
		Vitalock	Exeter	Vitalock	1	2.2
	F2l	SPH	Femoral *(Lima)*	SPH	1	2.2
	Hmrs	Vitalock	Exeter	Vitalock	1	2.2
	Integral	Secur-Fit	Modular *(Biomet)*	Constrained *(Osteonics)*	1	2.2
	MS 30	Mallory-Head	MS 30	Mallory-Head	1	2.2
		Allofit	Natural Hip	Armor	1	2.2
	S-Rom	Arthopor	S-Rom	S-Rom	1	2.2
	Secur-Fit	Secur-Fit	C-Taper	Omnifit	1	2.2
		Trident	C-Taper	Trident	1	2.2
	Stability	ABG II	Articul/Eze	ABG II	1	2.2
	Versys	Trilogy	Femoral Head *(Zimmer)*	Longevity	1	2.2
			Versys	Longevity	1	2.2
Insert Only	Charnley	Vitalock	N/R	Vitalock	1	2.2
	Exeter	Vitalock	N/R	Vitalock	1	2.2
Head Only	Exeter	Vitalock	Exeter	N/R	2	4.3
		Contemporary	Exeter	N/R	3	6.5
		Exeter	V40	N/R	1	2.2
	ABG II	ABG II	V40	N/R	1	2.2
	APR	Artek	Artek	N/R	1	2.2
	C-Stem	Charnley	Elite Modular	N/R	1	2.2
	Mallory-Head	Mallory-Head	Modular *(Biomet)*	N/R	1	2.2
	Secur-Fit Plus	Omnifit	C-Taper	N/R	1	2.2
	Synergy	Reflection	Tapered Femoral Head	N/R	1	2.2
	Taperloc	Mallory-Head	Modular *(Biomet)*	N/R	1	2.2
Cable/ Minor	Charnley	Charnley	N/R	N/R	1	2.2
	ABG II	ABG II	N/R	N/R	1	2.2
Total					**46**	**100.0**

Note: *model name not repeated but continues down the column until change of model name , *entries do not equal 100% due to rounding, N/R equals not revised*

Femoral Head Size, Demographics and Relationship to Revision for Dislocation

Graph H4: Distribution of Unipolar Head Diameter by Gender



Graph H5: Distribution of Bipolar Head Size by Gender

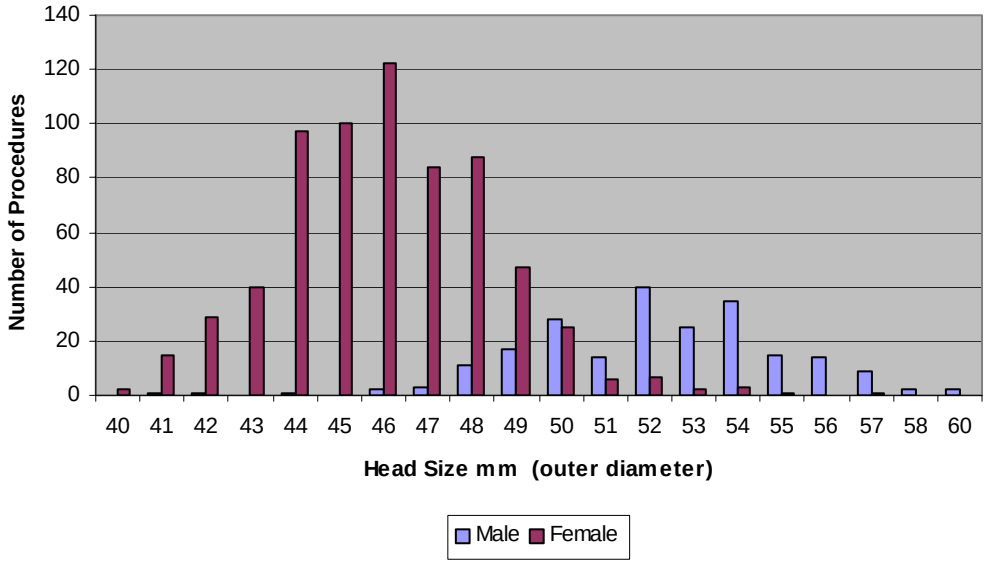


Table H47: Femoral Head Size for Primary Total Hips

	Primary						*Total*	
	Total Hip Systems		*Resurfacing System*		*Thrust Plate*			
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
22mm	1397	9.4	-	-	-	-	1397	8.9
26mm	3150	21.2	-	-	-	-	3150	20.1
28mm	8920	60.1	-	-	34	87.2	8954	57.2
30mm	18	0.1	-	-	-	-	18	0.1
32mm	989	6.7	-	-	-	-	989	6.3
36mm	219	1.5	-	-	-	-	219	1.4
38mm	149	1.0	6	0.8	5	12.8	160	1.0
42mm	-	-	101	13.3	-	-	101	0.6
44mm	-	-	2	0.3	-	-	2	0.0
45mm	-	-	1	0.1	-	-	1	0.0
46mm	-	-	184	24.3	-	-	184	1.2
48mm	-	-	10	1.3	-	-	10	0.1
50mm	-	-	249	32.9	-	-	249	1.6
52mm	-	-	10	1.3	-	-	10	0.1
53mm	-	-	1	0.1	-	-	1	0.0
54mm	-	-	160	21.1	-	-	160	1.0
56mm	-	-	1	0.1	-	-	1	0.0
58mm	-	-	32	4.2	-	-	32	0.2
Missing	3	0.0	-	-	-	-	3	0.0
Total	**14845**	**100.0**	**757**	**100.0**	**39**	**100.0**	**15641**	**100.0**

Note: *3 heads sizes were unable to be confirmed but are likely to be the same as the acetabular components which are 1x26mm and 2x28mm.*

Table H48: Femoral Head Size for Primary Total and Revision for Dislocation

Primary Head Size	***Primary***		***Revisions***		***Revisions due to Dislocation***		
	N	*%*	*N*	*%*[*]	*N*	*%*[†]	*%*[‡]
22mm	1397	9.4	14	1.00	9	64.3	0.64
26mm	3150	21.2	33	1.05	20	60.6	0.63
28mm	8920	60.1	96	1.08	40	41.7	0.45
>= 30mm	1375	9.3	11	0.80	3	27.3	0.22
Not known	3		1	33.33	0	0.0	0.00
Total	**14845**	**100.0**	**155**	**1.04**	**72**	**46.5**	**0.49**

Note: [*]*equals percent of primary procedures revised,* [†]*equals percent of revisions,* [‡] *equals percent of primary procedures revised due to dislocation.*

AOA National Joint Replacement Registry
Knee Replacement Data

The data presented in this report have been processed and analysed by the Registry for the period 1/9/99-31/12/01. It is a proportion of the knee replacement surgery that has been undertaken nationally during this period. As has been explained previously there has been a staged implementation of the Registry. This has involved the progressive inclusion of information from an increasing number of hospitals undertaking joint replacement surgery. This staged implementation has been undertaken on a state by state basis. In the 2001 report we analysed information from just under 6,000 knee procedures. In this report we detail information on almost 22,000 knee procedures. As a consequence of the staged implementation there has been an increase in the proportion of the knee replacements being recorded so that for year ending 2001 we have information on approximately 70% of the procedures. As implementation has been completed during 2002, next year's report will have information on almost 100% of procedures undertaken in 2002.

Demographics

Primary total knee replacements account for 77% of all knee procedures, unicompartmental 13.0%, revision 9.5% and a small number of patellar/trochlear replacements have been performed. There has been a small increase in unicompartmental replacement. This may represent a change in practice, but is more likely to represent the inclusion of a higher proportion of Victorian and New South Wales data. Government data indicate that both states undertake significant numbers and there is a much higher proportion of use of unicompartmental knee replacement in New South Wales when compared to other states (Table G1). As New South Wales was the most recent state to have data included in the Registry, it can be anticipated that there will be a further increase related to this effect in next year's report.

Patients undergoing primary total knee replacement are on average three years older than patients having primary total hip replacements (Tables K5 & H4). Unicompartmental knee replacement is generally performed in a younger population. There is however a significant number of older individuals receiving this type of replacement, with almost 40% being over 70 years and 8.4% over 80 years of age (Table K4, Graph K2). Patellar/trochlear replacements are undertaken on patients substantially younger than any other knee replacement procedure.

The age of patients undergoing revision knee replacement is only slightly older than those undergoing primary total knee (Table K6). This revision group includes patients who have had re-operations of unicompartmental, patellar/trochlear, primary total knees as well as previous revisions. As pointed out in last year's report, the younger age of patients undergoing revision surgery is likely to reflect that younger patients having primary knee replacement are more likely to require revision.

Patellar/trochlear replacement is undertaken more commonly in females (Table K3). Unicompartmental knee replacement is the only knee replacement procedure that is more commonly undertaken in males (Table K4). Primary total knee replacement is more common in females. The gender differences are greater than observed with primary total hip replacement (Tables K5 & H4).

Osteoarthritis is the most common diagnosis for all forms of primary knee replacement. There are a small number of patients who have had patellar/trochlear and unicompartmental replacement for inflammatory arthritis (Tables K7-K9).

Loosening is the most common diagnosis for revision surgery. Infection also remains a major cause for revision, being responsible for 12.5% of all revision procedures. As mentioned in the 2001 report there are many revisions undertaken where the diagnosis is uncertain. Pain is recorded by surgeons as the diagnosis in the absence of a definitive aetiology being established. Implant breakage is also an important cause of revision (Table K10). Currently the vast majority of revisions are undertaken on patients where the registry is not aware of the prostheses used prior to this procedure. This is a situation that will improve with time. As a consequence however in the majority of instances it remains unknown to the registry which components have broken. In addition, it is currently not possible to determine the proportion of components used that have broken. Prostheses breakage is an important Registry focus. As time progresses the proportion of revisions being undertaken where the primary components have been previously identified by the Registry will increase. In the future it will be possible to accurately assess the incidence of component breakage related to particular prostheses.

Prosthesis Usage and Fixation for Primary Knee Replacement

Three types of patellar/trochlear replacement have been used. In two patients only the trochlear was replaced (Table K11). Twelve different types of unicompartmental knee replacements have been used. The Oxford 3 is the most common with the Allegretto the second most popular. (Table K13). More than 90% of unicompartmental replacements use cement fixation.

Cement is also the most common method of fixation for primary total knees. Just under 80% of tibial components and a little more than 50% of femoral components are cemented (Table K14). The incidence of cement use has not changed when compared to the 2001 report.

The patella is resurfaced in 39.4% of primary total knee replacements (Table K14). The likelihood of the patella being resurfaced relates to the type of fixation used for the femoral and tibial components. It is more likely for the patella to be resurfaced if both the femoral and tibial components are cemented (45.7%) and much less if they are both inserted in a cementless manner (23.0%). When the patella is used it is cemented in the vast majority of cases (Table K14).

The LCS remains the most common primary total knee replacement irrespective of the method of fixation. The Registry has recorded the use of 44 different primary total knee replacements. The ten most common are used in 87.5% of all procedures (Table K19). The top five are the same as reported in the 2001 report. There are however changes in the next five. These changes are mostly likely due to regional variation in prostheses use, which have become evident as a consequence of the staged implementation of the Registry.

Prosthesis Usage and Fixation for Revision Knee Replacement

Knee revision has been divided into major and minor revisions. They are defined in a similar manner to the hip in that a major revision is a procedure where a major component has been replaced or removed. A major component is a component that interfaces with bone with the exception of the patella. Therefore a revision involving the removal and/or insertion of a tibial and/or femoral component is a major revision. Any revision involving a patellar component alone or a component that does not interface with bone (i.e. a tibial insert) either alone or in combination with a patellar component is regarded as a minor revision. There have been 2092 knee revisions reported. Using the above definitions 61.4% are major revisions and 38.6% are minor (Tables K20 & K21).

The most common major revision involves the insertion of both tibial and femoral components (70.4%). The tibial component only has been used in 15.3% of cases and the femoral component only in 6.0% (Table K20).

Unicompartmental to unicompartmental revisions have occurred in 1.9% of the major revisions. Major revisions also include the use of cement spacers, fusion nails, removal without replacement, and reinsertion of

original components (Table K21). These are included, as there has been removal of one or more of the original major components.

In minor revisions a patellar prosthesis has been used in 57.4% of cases. As was reported in 2001 just under half of these are associated with the use of a tibial insert. A tibial insert only has been used in 41.3% of cases (38.6% total knee and 2.8% unicompartmental) (Table K21). Cement is the usual method of fixation following major revision. Over 90% of the tibial components and just under 90% of the femoral components are cemented (Table K22). A patellar component is used in association with a major revision in 36.4% of cases. It is cemented 96% of the time (Table K20).

The component types used in major unicompartmental and total knee revision are reported in Tables K23-K34. The tables are subdivided depending on which type of component was inserted and whether cement or cementless fixation was used. Independent of the type of fixation, the five most common total knee replacements used for major knee revisions, where both tibial and femoral components are replaced, account for 58.2% of prostheses used. They include: Genesis II (16.3%), Nexgen (12.1%), Duracon (10.5%), LCS (10.4%) and the PFC Sigma (8.6%).

The prostheses used for revisions where only a single major component is replaced are dictated by the remaining components. In the 2001 report, it was mentioned that it was theoretically possible to get an indication of prosthesis performance when the preceding procedure was undertaken prior to the registry collecting data. This relies on the clinical need to match knee components during revision when one or more of the components are left in situ. It is possible to determine with a reasonable degree of certainty the features of the original component when one of the components has been replaced in a major revision or when a tibial insert is replaced in a minor revision. Although providing a useful indicator of potential problems it is not possible to determine the revision rate. If however the frequency of revision for a particular prosthesis is well above what could be reasonably anticipated when compared to a likely estimate of its overall frequency of use, the potential to raise concerns about the performance of that particular prosthesis exists. This is particularly so if a prosthesis is disproportionately represented when there is an unusual mode of failure. Currently the Registry has not identified any components of concern using this approach.

Bilateral Primary Knee Replacement

Bilateral knee replacement is common with 8.4% of patients undergoing bilateral primary knee procedures. This has increased compared to last year. It can be anticipated that the longer the registry collects data then this number will increase as more patients have a knee replacement on the contralateral side.

Same day bilateral primary knee replacement is common with almost 1 in 20 patients undergoing bilateral knee replacement during the one operation. The Registry has data on almost 800 patients that have undergone this procedure.

It will be possible to report mortality figures in comparison to unilateral primary knee replacements for this group in the 2003 report.

Registry Recorded Primary to Revision Surgery

This section provides data on prostheses performance. To date the Registry has information on 157 revisions of primary knee replacements already recorded within the Registry. This represents 7.5% of all Registry revisions. This is an increase from the 3.8% reported in the 2001 report. With time this figure will approach 100%.

Of the 157 knee revisions over 80% were performed more than six weeks after the original procedure (Table K40). The most common reason was loosening (24.8%) followed by infection (19.7%) (Table K41). It is important to understand that this figure is not the infection rate for knee replacement surgery but the percentage of revision procedures undertaken for infection.

One patellar/trochlear replacement has been revised. The proportion of unicompartmental replacements revised

during this time period was 1.4 %. This includes what appears to be a high proportion of revisions for the Allegretto knee (4.2%) (see below).

The proportion of primary total knees revised was 0.7%. All total primary knees requiring revision are listed (Table K49). The proportion revised appears high for two of the prostheses. They are the TRAC and AMK. Initial unadjusted statistical evaluation indicates that this appears significant (P=0.004 for both). The Trac revisions however involved small numbers with only four procedures. Most of the AMK revisions have been for patello-femoral pain and involved insertion of a patellar prosthesis as the revision procedure. Details of the revision of primary total knees are listed (Tables K50-K52).

Revision to Revision Recorded Knee Replacements

The Registry has an increasing number (130) of revision knee replacements that have undergone subsequent revision. The majority of these revision to revision procedures listed are for infection (almost 60%). Most of these represent the second stage of a two-stage revision. The next most common reason for a subsequent revision procedure is loosening. Excluding infection the proportion of revision to revision procedures listed in the Registry is 2.3% compared to 0.7% for all primary knee procedures (data not shown).

Allegretto Unicompartmental Knee

The Allegretto is one of the most commonly used unicompartmental knee replacements (11.6%). There were 14 revisions of this prosthesis to December 2001. This represents 4.2% of the total 332 procedures undertaken during September 1999 to December 2001. As part of the Registry's initial statistical screen to determine if this finding had any potential importance, the poisson probability of the chance of this or more revisions occuring was estimated. This was significant (P=0.0003). The poisson probability was estimated based on the proportion of 1.4 revisions per 100 procedures, for all unicompartmental replacements in the Registry.

To determine if the Allegretto has a higher early revision rate than other types of unicompartmental knee replacement, a variety of different analyses were undertaken. These included: a Kaplan-Meier estimation of survivorship and resulting plots of survival probabilities and cumulating revision rates; a log-rank test of difference in survival (i.e. revision free) and hazard ratio (estimated using proportional hazards (Cox) regression) of primary unicompartmental knees with the Allegretto being compared to all other primary unicompartmental knee replacements.

These results demonstrate a significant difference in the performance of the Allegretto compared to other unicompartmental knee replacements (Graphs K5 & K6). These analyses have also been undertaken with adjustments for age and gender which did not affect the significance (data not shown). It is known that this procedure has been undertaken in a number of different hospitals and most States.

Additionally data that have been entered into the Registry for 2002 were also examined. Although these data are incomplete it was possible to identify at least a further four revisions of the Allegretto knee replacements implanted before December 31st 2001. These revisions were from four separate hospitals.

Currently, the evidence indicates that the increased revision rate cannot be ascribed to chance. It appears that this group of Allegretto knee replacements has a higher rate of early revision compared to other unicompartmental knees. It is not evident why this is occurring. None of the revisions were undertaken as a consequence of infection. Examination of the diagnosis provided to the Registry at the time of the revisions indicates that either ongoing pain or loosening of one or more of the components was amongst the reasons given.

Knee Replacement - 1/9/1999 to 31/12/2001

Table K1: Number of Knee Replacements by sex

Type of knee replacement	***Female***		***Male***		***Total***	
	Number	*%*	*Number*	*%**	*Number*	*%*
Patellar/trochlear	61	0.3	22	0.1	83	0.4
Unicompartmental Knee	1372	6.2	1490	6.8	2862	13.0
Primary Total Knee	9493	43.2	7443	33.9	16936	77.1
Revision Knee	1092	5.0	1000	4.6	2092	9.5
Total	**12018**	**54.7**	**9955**	**45.3**	**21973**	**100.0**

Note: *percents shown are out of 21973*

Definitions
Patellar/trochlear: *patellar/trochlear replacement*
Unicompartmental: *either medial or lateral unicompartmental knee replacement*
Primary total: *primary total knee replacement*
Revision: *re-operation for exchange or removal of one or more components*

Demographic characteristics of patients undergoing Knee Replacement – 1/9/1999 to 31/12/2001

Table K2: Summary statistics of age (by sex) for All Knee Replacements

	Female *N= 12018 (54.7%)*	***Male*** *N= 9955 (45.3%)*	***All Patients*** *N= 21973 (100.0%)*
Median	72	71	71
Minimum	20	17	17
Maximum	98	99	99
Mean	70.5	69.7	70.1
Standard Deviation	9.7	9.5	9.6

Table K3: Summary statistics of age (by sex) for Patellar/trochlear Replacement

	Female *N=61 (73.5%)*	***Male*** *N=22 (26.5%)*	***All Patients*** *N= 83 (100.0%)*
Median	56	53	56
Minimum	38	35	35
Maximum	83	77	83
Mean	59.1	52.1	57.2
Standard Deviation	11.3	10.5	11.4

Graph K1: Age and Sex - Patellar/trochlear Knee Replacement

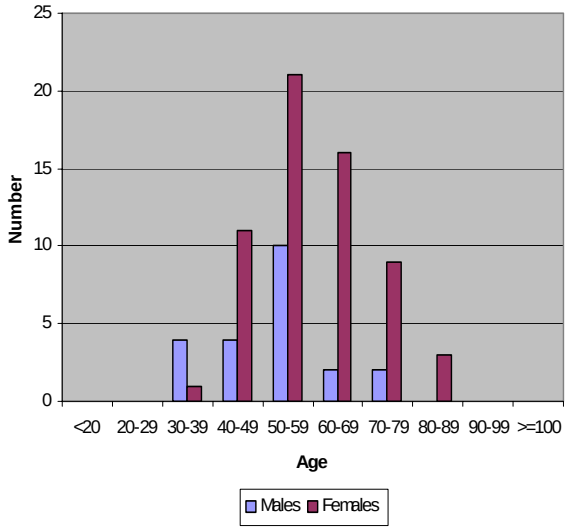


Table K4: Summary statistics of age (by sex) for Unicompartmental Knee Replacement

	Female *N= 1372 (47.9%)*	*Male* *N= 1490 (52.1%)*	*All Patients* *N=2862 (100.0%)*
Median	67	67	67
Minimum	25	33	25
Maximum	94	99	99
Mean	66.0	67.0	66.5
Standard Deviation	10.5	9.6	10.0

Graph K2: Age and Sex - Unicompartmental Knee Replacement

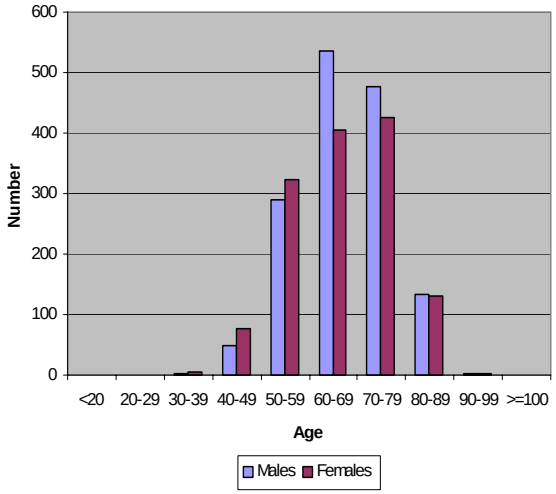


Table K5: Summary statistics of age (by sex) for Primary Total Knee Replacement

	Female *N= 9493 (56.1%)*	*Male* *N= 7443 (43.9%)*	*All Patients* *N= 16936 (100.0%)*
Median	72	71	72
Minimum	20	17	17
Maximum	98	95	98
Mean	71.1	70.1	70.7
Standard Deviation	9.3	9.3	9.3

Graph K3: Age and Sex - Primary Total Knee Replacement

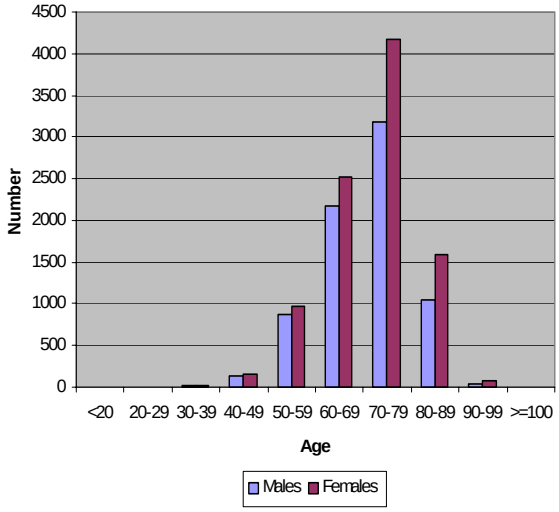
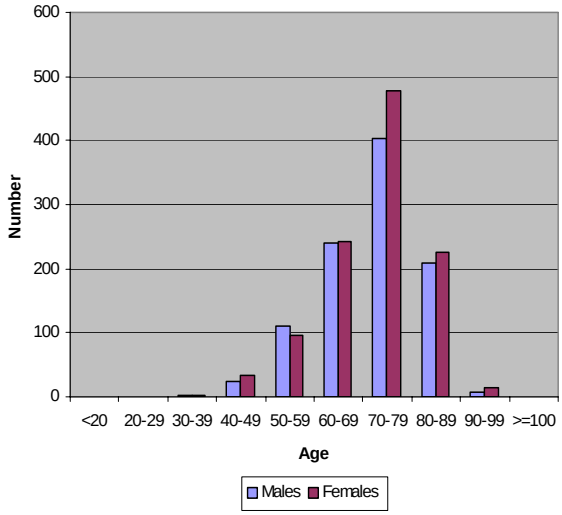


Table K6: Summary statistics of age (by sex) for Revision Knee Replacement

	Female *N= 1092 (52.2%)*	***Male*** *N= 1000 (47.8%)*	***All Patients*** *N= 2092 (100.0%)*
Median	73	73	73
Minimum	22	22	22
Maximum	95	93	95
Mean	71.8	71.2	71.5
Standard Deviation	10.1	10.1	10.1

Graph K4: Age and Sex - Revision Total Knee Replacement



Diagnosis for Knee Replacement - 1/9/1999 to 31/12/2001

Table K7: Diagnosis - Patellar/trochlear Replacement

Diagnosis	*Number*	*%*
Osteoarthritis	80	96.4
Other Inflammatory Arthritis	3	3.6
Total	**83**	**100.0**

Table K8: Diagnosis - Unicompartmental Knee Replacement

Diagnosis	*Number*	*%**
Osteoarthritis	2804	98.0
Avascular Necrosis	38	1.3
Rheumatoid Arthritis	10	0.3
Other Inflammatory Arthritis	9	0.3
Tumour	1	0.0
Total	**2862**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table K9: Diagnosis - Primary Total Knee Replacement

Diagnosis	*Number*	*%*
Osteoarthritis	16190	95.6
Rheumatoid Arthritis	507	3.0
Other Inflammatory Arthritis	141	0.8
Avascular Necrosis	75	0.4
Tumour	9	0.1
Other	14	0.1
Total	**16936**	**100.0**

Table K10: Diagnosis - Revision Knee Replacement

Diagnosis	*Number*	*%**
Loosening	875	36.2
Infection	311	12.9
Wear Tibial	196	8.1
Lysis	172	7.1
Implant Breakage Tibial	171	7.1
Patello Femoral Pain	159	6.6
Pain	105	4.3
Implant Breakage Patella	85	3.5
Instability	62	2.6
Fracture	54	2.2
Arthrofibrosis	36	1.5
Wear Patella	35	1.4
Progression Of Disease	33	1.4
Implant Breakage Femoral	22	0.9
Malalignment	20	0.8
Patella Maltracking	20	0.8
Bearing/Dislocation	17	0.7
Dislocation	13	0.5
Synovitis	10	0.4
Incorrect Sizing	8	0.3
Heterotropic Bone	3	0.1
Avascular Necrosis	2	0.1
Arthrodesis Takedown	1	0.0
Post Traumatic	1	0.0
Other	5	0.2
Total	**2416**	**100.0**

Note: *some patients had multiple diagnoses*
**entries do not equal 100% due to rounding*

Prosthesis Fixation and Usage for Patellar/trochlear Knee Replacement – 1/9/1999 to 31/12/2001

Table K11: Prosthesis Usage - Patellar/trochlear Replacement

Patellar/trochlear replacement	*Patella*	*Number*	*%**
Avon	none	2	2.4
Avon	Kinemax Plus	47	56.6
Lubinus Patella Glide	Lubinus Patella Glide	8	9.6
Mod III	Resurfacing System	26	31.3
Total		**83**	**100.0**

Note: **entries do not equal 100% due to rounding*

Prosthesis Fixation and Usage for Unicompartmental Knee Replacement – 1/9/1999 to 31/12/2001

Table K12: Prosthesis Fixation - Unicompartmental Knee Replacement

Fixation	*Number*	*%*
Tibial and femoral cemented	2598	90.8
Femoral only cemented	11	0.4
Tibial and femoral cementless	253	8.8
Total	**2862**	**100.0**

Table K13: Prosthesis Usage - Unicompartmental Knee Replacement

Prosthesis used	*Number*	*%**
Oxford 3	1365	47.7
Allegretto	332	11.6
Repecci	331	11.6
M/G	276	9.6
Unix	205	7.2
PFC Sigma	125	4.4
Preservation	92	3.2
Genesis	74	2.6
Natural Knee	39	1.4
LCS	20	0.7
HLS Uni Evolution	2	0.1
Endo-Model Sled	1	0.0
Total	**2862**	**100.0**

Note: **entries do not equal 100% due to rounding*

Prosthesis Fixation and Usage for Primary Total Knee Replacement - 1/9/1999 to 31/12/2001

Table K14: Prosthesis Fixation - Primary Total Knee Replacement

Fixation	*Total*		*Patella used*			
			Patella cementless		*Patella cemented*	
	Number	*%**	*Number*	*%†*	*Number*	*%†*
Tibial and femoral cementless	3461	20.4	320	9.2	478	13.8
Tibial and femoral cemented	8611	50.8	2	0.0	3938	45.7
Tibial only cemented	4775	28.2	44	0.9	1835	38.4
Femoral only cemented	89	0.5	1	1.1	47	52.8
Total	**16936**	**100.0**	**367**	**2.2**	**6298**	**37.2**

Note: **entries do not equal 100% due to rounding*
†percents shown are row percents out of total number

Table K15: Prosthesis Usage - Primary Total Knee Replacement where both the Tibial and Femoral components were Cementless

Prosthesis Used	*Total Number*	*%**	*Patella used*	*%†*
LCS	1200	34.7	348	29.0
Nexgen	513	14.8	40	7.8
Duracon	355	10.3	69	19.4
Scorpio	253	7.3	76	30.0
Natural Knee	223	6.4	82	36.8
Genesis II	198	5.7	21	10.6
Maxim	145	4.2	48	33.1
Advantim	140	4.0	16	11.4
Profix	103	3.0	18	17.5
AMK	81	2.3	7	8.6
Others (10)	250	7.4	73	29.2
Total	**3461**	**100.0**	**798**	**23.1**

Note: **entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K16: Prosthesis Usage - Primary Total Knee Replacement where both the Tibial and Femoral Component were Cemented

Prosthesis Used	*Total Number*	*%**	*Patella used*	*%†*
LCS	1527	17.7	522	34.2
Nexgen	1305	15.2	509	39.0
Genesis II	1302	15.1	682	52.4
Duracon	1074	12.5	615	57.3
PFC Sigma	548	6.4	297	54.2
AGC	510	5.9	183	35.9
Scorpio	450	5.2	234	52.0
Kinemax Plus	442	5.1	389	88.0
Profix	262	3.0	90	34.4
Nexgen Mbk	161	1.9	13	8.1
Other (32)	1030	11.9	406	39.4
Total	**8611**	**100.0**	**3940**	**45.8**

Note: **entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K17: Prosthesis Usage - Primary Total Knee Replacement where the Tibial component was Cemented and the Femoral component was Cementless

Prosthesis Used	*Total Number*	*%**	*Patella used*	*%†*
Duracon	1103	23.1	432	39.2
Scorpio	679	14.2	419	61.7
LCS	570	11.9	145	25.4
PFC Sigma	524	11.0	203	38.7
Nexgen	463	9.7	208	44.9
Genesis II	433	9.1	144	33.3
AGC	269	5.6	52	19.3
Natural Knee	200	4.2	112	56.0
AMK	141	3.0	10	7.1
Nexgen Mbk	81	1.7	38	46.9
Other (20)	312	6.6	116	37.2
Total	**4775**	**100.0**	1879	39.4

Note: **entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K18: Prosthesis Usage - Primary Total Knee Replacement where the Tibial component was Cementless and the Femoral component was Cemented

Prosthesis Used	*Total Number*	*%**	*Patella used*	*%†*
Profix	17	19.1	13	76.5
Genesis II	13	14.6	7	53.8
Maxim	11	12.4	2	18.2
PFC Sigma	11	12.4	-	-
Duracon	9	10.1	2	22.2
Scorpio	8	9.0	4	50.0
LCS	4	4.5	3	75.0
Advantim	3	3.4	3	100.0
Nexgen	3	3.4	1	33.3
AMK	2	2.2	2	100.0
Other (7)	8	8.8	4	50.0
Total	**89**	**100.0**	**41**	**46.1**

Note: *- equals no patella used*
**entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Top Ten Knee Prostheses used for Primary Total Knee Replacement – 1/9/1999 to 31/12/2001

Table K19: Top Ten Knee Prostheses used in Primary Total Knee Replacements

Femoral Prosthesis	*Number*	*%*
LCS	3301	19.5
Duracon	2541	15.0
Nexgen	2284	13.5
Genesis II	1946	11.5
Scorpio	1390	8.2
PFC Sigma	1123	6.6
AGC	779	4.6
Natural Knee	548	3.2
Profix	454	2.7
Kinemax Plus	452	2.7
Other (34)	2118	12.5
Total	**16936**	**100.0**

Note: *other (n) equals the number of other types of prostheses*

Prosthesis Fixation and Usage for Revision Knee Replacement - 1/9/1999 to 31/12/2001

Table K20: Components Used - Major Revision Knee Replacement

Components Used	*Total*		*Patella used*			
			cementless		*cemented*	
	Number	*%**	*Number*	*%†*	*Number*	*%†*
Tibial and Femoral	904	70.4	14	1.5	390	43.1
Tibial Only	197	15.3	5	2.5	39	19.8
Femoral Only	77	6.0	1	1.3	18	23.4
Uni Tibial and Femoral	7	0.5	-	-	-	-
Uni Tibial Only	11	0.9	-	-	-	-
Uni Femoral Only	7	0.5	-	-	-	-
Cement spacer	64	5.0	-	-	-	-
Removal of Prostheses	6	0.5	-	-	-	-
Fusion Nail	8	0.6	-	-	-	-
Reinsertion of Components	2	0.2	-	-	-	-
Patellar/trochlear Resurfacing	1	0.1	-	-	-	-
Total	**1284**	**100.0**	**20**	**1.6**	**447**	**34.8**

Note: *- equals no patella used*
**entries do not equal 100% due to rounding*
†percents shown are row percents out of total number

Table K21 Components Used - Minor Revision Knee Replacement

Components Used	*Number*	*%**
Insert Only	312	38.6
Patella Only	237	29.3
Insert and Patella	227	28.1
Uni Insert Only	23	2.8
Removal Patella	7	0.9
Other	2	0.2
Total	**808**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table K22: Prosthesis Fixation - Major Revision Knee Replacement

Components Used	*Cemented*		*Cementless*		*Tibial cemented Femoral cementless*		*Tibial cementless Femoral cemented*		*N/A*		*Total*	
	N	*%*	*N*	*%**	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%**
Tibial and Femoral	741	57.7	52	4.0	73	5.7	38	3.0	-	-	904	70.4
Tibial Only	189	14.7	8	0.6	-	-	-	-	-	-	197	15.3
Femoral Only	71	5.5	6	0.5	-	-	-	-	-	-	77	6.0
Uni Tibial and Femoral	6	0.5	1	0.1	-	-	-	-	-	-	7	0.5
Uni Tibial Only	11	0.9	-	-	-	-	-	-	-	-	11	0.9
Uni Femoral Only	7	0.5	-	-	-	-	-	-	-	-	7	0.5
Cement spacer	-	-	-	-	-	-	-	-	64	5.0	64	5.0
Removal of Prostheses	-	-	-	-	-	-	-	-	6	0.5	6	0.5
Fusion Nail	-	-	-	-	-	-	-	-	8	0.6	8	0.6
Reinsertion of Components[†]	2	0.2	-	-	-	-	-	-	-	-	2	0.2
Patellar/Trochlear Resurfacing	1	0.1	-	-	-	-	-	-	-	-	1	0.1
Total	**1028**	**80.6**	**67**	**5.2**	**73**	**5.7**	**38**	**3.0**	**78**	**6.1**	**1284**	**100.0**

Note: *N/A means not applicable because a knee component was not used.*
[*]entries do not equal total due to rounding
[†]prostheses removed cleaned and reinserted

Table K23: Patellar/trochlear Resurfacing - Major Revision Knee Replacement - Trochlear component only

Prosthesis Used	*Number*
Mod III	1
Total	**1**

Table K24: Prosthesis Used - Unicompartmental - Major Revision Knee Replacement - Tibial and Femoral component

Prosthesis Used	*Number*
Oxford 3	4
Genesis	2
Unix	1
Total	**7**

Table K25: Components Used - Unicompartmental - Major Revision Knee Replacement - Tibial component only

Prosthesis Used	*Number*
Oxford 3	5
Endo-Model Sled	2
Genesis	1
M/G	1
Repecci	1
PFC Sigma	1
Total	**11**

Table K26: Components Used - Unicompartmental - Major Revision Knee Replacement - Femoral component only

Prosthesis Used	*Number*
Oxford 3	4
Allegretto	2
M/G	1
Total	**7**

Table K27: Prosthesis Usage - Major Revision Knee Replacement where both the Tibial and Femoral components were Cemented

Prosthesis Used	*Total*		*Patella used*	
	Number	*%**	*Number*	*%†*
Genesis II	142	19.2	55	38.7
Nexgen	99	13.4	47	47.5
Duracon	81	10.9	49	60.5
PFC Sigma	70	9.4	35	50.0
LCS	58	7.8	28	48.3
Profix	51	6.9	22	43.1
S-Rom	36	4.9	15	41.7
Natural Knee	33	4.5	23	69.7
Maxim	32	4.3	16	50.0
Scorpio	26	3.5	15	57.7
Other (15)	113	15.3	38	33.6
Total	**741**	**100.0**	**343**	**46.3**

Note: **entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K28: Prosthesis Usage - Major Revision Knee Replacement where both the Tibial and Femoral components were Cementless

Prosthesis Used	*Total*		*Patella used*	
	Number	*%**	*Number*	*%†*
LCS	19	36.5	2	10.5
Natural Knee	8	15.4	5	62.5
S-Rom	8	15.4	4	50.0
Scorpio	4	7.7	1	25.0
Advantim	3	5.8	-	-
Advance	2	3.8	1	50.0
Profix	2	3.8	1	50.0
Other (6)	6	11.4	1	100
Total	**52**	**100.0**	**16**	**30.8**

Note: *- equals no patella used*
**entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K29: Prosthesis Usage - Major Revision Knee Replacement where the Tibial component was Cementless and the Femoral component was Cemented

Prosthesis Used	*Total*		*Patella used*	
	Number	*%*	*Number*	*%†*
S-Rom	7	18.4	1	14.3
Nexgen	5	13.2	2	40.0
PFC Sigma	4	10.5	1	25.0
Advantim	3	7.9	-	-
Genesis II	3	7.9	1	33.3
Duracon	3	7.9	2	66.7
Natural Knee	3	7.9	2	66.7
LCS	3	7.9	2	66.7
Profix	3	7.9	2	66.7
Other (4)	4	10.5	-	-
Total	**38**	**100.0**	**13**	**34.2**

Note: *- equals no patella used*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K30: Prosthesis Usage - Major Revision Knee Replacement where the Tibial components were Cemented and the Femoral Components were Cementless

Prosthesis Used	*Total*		*Patella used*	
	Number	*%**	*Number*	*%†*
Scorpio	19	26.0	10	52.6
LCS	14	19.2	2	14.3
Duracon	11	15.1	4	36.4
Natural Knee	9	12.3	5	55.6
Nexgen	4	5.5	3	75.0
AGC	3	4.1	2	66.7
PFC Sigma	3	4.1	1	33.3
Apollo Knee	2	2.7	1	50.0
S-Rom	2	2.7	-	-
Other (6)	6	8.4	4	66.6
Total	**73**	**100.0**	**32**	**43.8**

Note: *- equals no patella used*
**entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K31: Prosthesis Usage - Major Revision Knee Replacement where the Tibial component only was used and was Cemented

Prosthesis Used	*Total*		*Patella used*	
	Number	*%*	*Number*	*%†*
LCS	30	15.9	3	10.0
Duracon	28	14.8	7	25.0
Genesis II	24	12.7	4	16.7
PFC Sigma	21	11.1	10	47.6
M/G II	17	9.0	8	47.1
Series 7000	11	5.8	3	27.3
Natural Knee	9	4.8	-	-
I/B II	7	3.7	-	-
Coordinate	6	3.2	2	33.3
Kinemax Plus	6	3.2	1	16.7
Other (14)	30	15.8	6	20
Total	**189**	**100.0**	**44**	**23.3**

Note: *- equals no patella used*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K32: Prosthesis Usage - Major Revision Knee Replacement where the Tibial component only was used and was Cementless

Prosthesis Used	*Total*		*Patella used*	
	Number	*%*	*Number*	*%*
LCS	3	37.5	3	100.0
Maxim	2	25.0	2	100.0
MRS	1	12.5	1	100.0
Duracon	1	12.5	1	100.0
Natural Knee	1	12.5	1	100.0
Total	**8**	**100.0**	**8**	**100.0**

Table K33: Components Used - Major Revision Knee Replacement where the Femoral component only was used and was Cemented

Prosthesis Used	*Total*		*Patella used*	
	Number	*%**	*Number*	*%†*
LCS	11	15.5	1	9.1
Duracon	8	11.3	2	25.0
Coordinate	6	8.5	2	33.3
Nexgen	6	8.5	1	16.7
PFC Sigma	5	7.0	3	60.0
Series 7000	4	5.6	-	-
Genesis	4	5.6	1	25.0
Natural Knee	3	4.2	1	33.3
Profix	3	4.2	-	-
Kinemax Plus	3	4.2	2	66.7
Other (12)	18	25.2	5	27.8
Total	**71**	**100.0**	**18**	**25.4**

Note: *- equals no patella used*
**entries do not equal 100% due to rounding*
†percents shown are row percents out of total number
other (n) equals the number of other types of prostheses

Table K34: Components Used - Major Revision Knee Replacement where the Femoral component only was used and was Cementless

Prosthesis Used	*Total*		*Patella used*	
	Number	*%**	*Number*	*%†*
Genesis II	1	16.7	-	-
Kinemax Plus	1	16.7	-	-
Advantim	1	16.7	-	-
M/G	1	16.7	1	100.0
PFC Sigma	1	16.7	-	-
Maxim	1	16.7	-	-
Total	**6**	**100.0**	**1**	**16.7**

Note: *- equals no patella used*
**entries do not equal 100% due to rounding*
†percents shown are row percents out of total number

Table K35: Prosthesis Usage - Minor Revision Knee Replacement where a Patella only was used

Patella Used	*Total*	
	Number	*%**
LCS	38	16.0
Genesis II	30	12.7
Duracon	26	11.0
AGC	20	8.4
Nexgen MBK	19	8.0
AMK	15	6.3
I/B II	13	5.5
Series 7000	10	4.2
PFC Sigma	10	4.2
Genesis	9	3.8
Other (15)	47	19.6
Total	**237**	**100.0**

Note: **entries do not equal 100% due to rounding*
other (n) equals the number of other types of patellas

Table K36: Prosthesis Usage - Minor Revision Knee Replacement where an Insert only was used

Insert Used	*Total*	
	Number	*%**
LCS	54	17.3
Duracon	42	13.5
Genesis	39	12.5
M/G II	25	8.0
PCA	24	7.7
M/G	20	6.4
Nexgen	19	6.1
PFC Sigma	19	6.1
Advantim	12	3.8
AMK	10	3.2
Other (13)	48	15.2
Total	**312**	**100.0**

Note: **entries do not equal 100% due to rounding*
other (n) equals the number of other types of inserts

Table K37: Prosthesis Usage - Minor Revision Knee Replacement where a Patella and an Insert were used

Insert Used	*Patella Used*	*Total*	
		Number	*%**
M/G	I/B II	40	17.6
	Genesis II	1	0.4
M/G II	M/G II	38	16.7
	Nexgen MBK	1	0.4
Genesis	Genesis	12	5.3
	Genesis II	9	4.0
Duracon	Duracon	16	7.0
	PCA	4	1.8
PFC Sigma	PFC Sigma	16	7.0
LCS	LCS	13	5.7
PCA	Duracon	2	0.9
	PCA	8	3.5
	Kinematic	1	0.4
Scorpio	Scorpio	10	4.4
	Series 7000	1	0.4
Ortholoc	M/G II	1	0.4
	Advantim	10	4.4
Advantim	Advantim	10	4.4
Other (12)	Other	34	14.6
Total		**227**	**100.0**

Note: *model name not repeated but continues down the column until change of model name*
**entries do not equal 100% due to rounding*
other (n) equals the number of other prostheses

Table K38: Prosthesis Usage - Minor Revision Knee Replacement where a Unicompartmental Insert only was used

Insert Used	*Total*	
	Number	*%**
Oxford 3	13	56.5
M/G	5	21.7
Unix	2	8.7
Genesis	2	8.7
Oxford 2	1	4.3
Total	**23**	**100.0**

Note: **entries do not equal 100% due to rounding*

Bilateral Knee Replacement - 1/9/1999 to 31/12/2001

Table K39: Days between procedures for Bilateral Primary Knees

1st Procedure	*2nd Procedure*	*Days between Bilateral Procedures*											
		Same Day		*<2 weeks*		*2-6 weeks*		*6 weeks - 6 months*		*> 6 months*		***Total***	
		N	*%*	*N*	*%*	*N*	*%**	*N*	*%*	*N*	*%*	*N*	*%*
Patellar/trochlear	Patellar/trochlear	8	0.5	-	-	-	-	-	-	-	-	8	0.5
Uni	Uni	169	11.0	5	0.3	1	0.1	35	2.3	27	1.8	237	15.4
Uni	Primary Total	12	0.8	-	-	1	0.1	3	0.2	8	0.5	24	1.6
Primary Total	Uni	9	0.6	1	0.1	2	0.1	4	0.3	6	0.4	22	1.4
Primary Total	Primary Total	601	39.1	36	2.3	15	1.0	291	18.9	303	19.7	1246	81.1
Total		**799**	**52.0**	**42**	**2.7**	**19**	**1.2**	**333**	**21.7**	**344**	**22.4**	**1537**	**100.0**

Note: **entries do not equal total % due to rounding*

Registry Recorded Primary to Revision Knee Replacement - 1/9/1999 to 31/12/2001

Table K40: Days to Revision by Primary procedure type

Primary Procedure (N)	*Days to revision Procedure*										***Total***		***% revised***
	Same Day		*<2 weeks*		*2-6 weeks*		*6 weeks - 1 year*		*>1 year*				
	N	*%*	*N*	*%**	*N*		*%*		*N*	*%**	*N*	*%*	*%*
Patellar/trochlear (83)	-	-	1	0.6	-	-	-	-	-	-	1	0.6	**1.2**
Uni (2862)	-	-	1	0.6	2	1.3	28	17.8	9	5.7	40	25.5	**1.4**
Primary Total (16936)	2	1.3	5	3.2	11	7.0	75	47.8	23	14.6	116	73.9	**0.7**
Total (19881)	**2**	**1.3**	**7**	**4.5**	**13**	**8.3**	**103**	**65.6**	**32**	**20.4**	**157**	**100.0**	**0.8**

Note: **entries do not equal total % due to rounding*

Table K41: Days to Revision by Revision Diagnosis

Revision Diagnosis	*Days to revision Procedure*										*Total*	
	Same Day		*<2 Weeks*		*2-6 Weeks*		*6 Weeks - 1 Year*		*>1 Year*			
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%**
Arthrofibrosis	-	-	-	-	-	-	3	1.8	3	1.8	6	3.6
Avascular Necrosis	-	-	-	-	-	-	2	1.2	-	-	2	1.2
Bearing/Dislocation	-	-	1	0.6	1	0.6	5	3.0	2	1.2	9	5.4
Dislocation	-	-	2	1.2	-	-	2	1.2	-	-	4	2.4
Fracture	1	0.6	-	-	-	-	7	4.2	-	-	8	4.8
Implant Breakage Femoral	-	-	-	-	-	-	-	-	1	0.6	1	0.6
Implant Breakage Patella	-	-	-	-	-	-	2	1.2	1	0.6	3	1.8
Implant Breakage Tibial	-	-	-	-	-	-	6	3.6	1	0.6	7	4.2
Incorrect Sizing	-	-	1	0.6	-	-	1	0.6	-	-	2	1.2
Infection	-	-	1	0.6	9	5.4	19	11.4	2	1.2	31	18.6
Instability	-	-	.	.	1	0.6	5	3.0	1	0.6	7	4.2
Loosening	-	-	2	1.2	2	1.2	26	15.6	9	5.4	39	23.4
Lysis	-	-	-	-	-	-	3	1.8	-	-	3	1.8
Malalignment	-	-	-	-	-	-	4	2.4	-	-	4	2.4
Pain	-	-	-	-	-	-	6	3.6	5	3.0	11	6.6
Patella Maltracking	-	-	-	-	-	-	1	0.6	-	-	1	0.6
Patello Femoral Pain	-	-	-	-	-	-	13	7.8	7	4.2	20	12.0
Progression Of Disease	-	-	-	-	-	-	1	0.6	3	1.8	4	2.4
Synovitis	-	-	-	-	-	-	1	0.6	-	-	1	0.6
Wear Patella	-	-	-	-	-	-	-	-	1	0.6	1	0.6
Wear Tibial	-	-	-	-	-	-	1	0.6	-	-	1	0.6
Other	1	0.6	-	-	-	-	1	0.6	-	-	2	1.2
Total	**2**	**1.2**	**7**	**4.2**	**13**	**7.8**	**109**	**65.3**	**36**	**21.6**	**167**	**100**

Note: **entries do not equal total % due to rounding*

Table K42: Primary to Revision procedure types

Primary	*Revision*	*Number*	*%*
Patellar/trochlear	Patellar/trochlear	1	0.6
Unicompartmental	Tibial and Femoral	23	14.6
	Uni Tibial and Femoral	2	1.3
	Uni Tibial Only	3	1.9
	Uni Femoral Only	4	2.5
	Uni Insert Only	7	4.5
	Cement spacer/cement	1	0.6
Primary Total Knee	Tibial and Femoral	18	11.5
	Tibial Only	15	9.6
	Femoral Only	6	3.8
	Insert and Patella	15	9.6
	Patella Only	23	14.6
	Insert Only	34	21.7
	Cement spacer	5	3.2
Total		**157**	**100.0**

Table K43: Components Used – Patellar/trochlear to Patellar/trochlear

Primary *Patellar/trochlear*	***Revision*** *Patellar/trochlear*	***Number Revised***	***Total Number***	***% of Total Revised***
Mod III	Resurfacing System	1	26	3.8
Avon	-	0	2	0.0
Avon	Kinemax Plus	0	47	0.0
Lubinus Patella Glide	Lubinus Patella Glide	0	8	0.0
Total		**1**	**83**	**1.2**

Table K44: Components Used – Patellar/trochlear to Patellar/trochlear to Revision - Resurfacing Patellar/trochlear

Primary *Patellar/trochlear*	***Primary*** *Patella*	***Revision*** *Patellar/trochlear*	***Number***	***%***
Mod III	Resurfacing Sys	Mod III	1	100.0
Total			**1**	**100.0**

Table K45: Total Unicompartmental Primary Knee Procedures requiring Revision

Unicompartmental	***Number Revised***	***Total Number***	***% of Total Revised***
Oxford 3	22	1365	1.6
Allegretto	14	332	4.2
PFC Sigma	2	125	1.6
Genesis	1	74	1.4
M/G	1	276	0.4
Repecci	0	331	0
Unix	0	205	0
Preservation	0	92	0
Natural Knee	0	39	0
LCS	0	20	0
Other (2)	0	3	0
Total	**40**	**2862**	**1.4**

Note: *other (n) equals the number of other prostheses*

Table K46: Components Used - Total Unicompartmental Primary to Total Knee Revision

Revision type	*Primary*	*Revision*		*N*	*%**
	Unicompartmental	*Femoral*	*Tibial*		
Tibial & Femoral	Allegretto	Duracon	Duracon	2	8.7
		LCS	LCS	4	17.4
		Natural Knee	Natural Knee	4	17.4
		Scorpio	Scorpio	2	8.7
		Scorpio	Series 7000	1	4.3
	Genesis	Genesis II	Genesis II	1	4.3
	Oxford 3	AGC	AGC	1	4.3
		Coordinate	Coordinate	1	4.3
		Genesis II	Genesis II	1	4.3
		LCS	LCS	1	4.3
		Maxim	Maxim	1	4.3
		Profix	Profix	2	8.7
		Scorpio	Series 7000	1	4.3
	PFC Sigma	LCS	LCS	1	4.3
Total				**23**	**100.0**

Note: **entries do not equal 100% due to rounding*

Table K47: Components Used - Total Unicompartmental Primary to Unicompartmental Revision

Revision type	*Primary*	*Revision*			*N*	*%**
	Femoral	*Femoral*	*Tibial*	*Insert*		
Tibial & Femoral	Oxford 3	Oxford 3	Oxford 3	Oxford 3	2	12.5
Tibial Only	Oxford 3	-	Oxford 3	Oxford 3	2	12.5
	PFC Sigma	-	PFC Sigma	PFC Sigma	1	6.3
Femoral Only	Allegretto	Allegretto	-	-	1	6.3
	M/G	M/G	-	-	1	6.3
	Oxford 3	Oxford 3	-	Oxford 3	2	12.5
Insert Only	Oxford 3	-	-	Oxford 3	7	43.8
Total					**16**	**100.0**

Table K48: Components Used - Total Unicompartmental Primary to Revision - Cement Spacer

Primary	*Revision*	*Number*	*%*
Femoral	*Cement Spacer*		
Oxford 3	Cement Spacer Antibiotic	1	100.0
Total		**1**	**100.0**

Table K49: Total Primary Knee Procedures requiring Revision

Total Primary	*Number Revised*	*Total Number*	*% of Total Revised*
LCS	25	3301	0.8
Duracon	19	2541	0.7
Genesis II	15	1946	0.8
Nexgen	12	2284	0.5
Scorpio	9	1390	0.6
AMK	7	283	2.5
Profix	5	454	1.1
Trac	4	92	4.3
PFC Sigma	4	1123	0.4
Advance	3	176	1.7
Natural Knee	3	548	0.5
Maxim	2	236	0.8
Nexgen MBK	2	242	0.8
Interax	1	58	1.7
Genesis	1	61	1.6
Series 7000	1	72	1.4
Advantim	1	263	0.4
Kinemax Plus	1	452	0.2
AGC	1	779	0.1
Other (25)	0	635	0.0
Total	**116**	**16936**	**0.7**

Note: *other (n) equals the number of other types of prostheses*

Table K50: Components Used - Total Knee Primary to Major Knee Revision

Revision type	*Primary*		*Revision*		*N*	%
	Femoral	*Tibial*	*Femoral*	*Tibial*		
Tibial & Femoral	Advance	Advance	Scorpio	Series 7000	1	2.6
	AGC	AGC	AGC	AGC	1	2.6
	AMK	Coordinate	Coordinate	Coordinate	1	2.6
	Duracon	Duracon	Duracon	Duracon	2	5.1
			Maxim	Maxim	1	2.6
			MRH	MRH	1	2.6
	Genesis II	Genesis II	Genesis II	Genesis II	1	2.6
	LCS	LCS	Duracon	Duracon	1	2.6
			LCS	LCS	1	2.6
			PFC Sigma	PFC Sigma	1	2.6
	Maxim	Maxim	AGC	AGC	1	2.6
	Natural Knee	Natural Knee	Apollo Knee	Apollo Knee	1	2.6
	Nexgen	Nexgen	CCK	Optetrak	1	2.6
			Nexgen	Nexgen	2	5.1
	PFC Sigma	PFC Sigma	PFC Sigma	PFC Sigma	2	5.1
	Sub Total				**18**	**46.2**
Tibial Only	Duracon	Duracon	-	Duracon	1	2.6
	Genesis II	Genesis II	-	Genesis II	1	2.6
	Genesis II	Mobile Bearing	-	Genesis II	1	2.6
	Genesis II	Mobile Bearing	-	Mobile Bearing	2	5.1
	LCS	LCS	-	LCS	4	10.3
	LCS	LCS	-	PFC Sigma	1	2.6
	Maxim	Maxim	-	Maxim	1	2.6
	Natural Knee	Natural Knee	-	Natural Knee	1	2.6
	Scorpio	Scorpio	-	Series 7000	1	2.6
	Scorpio	Series 7000	-	Series 7000	1	2.6
	Trac	Trac	-	Trac	1	2.6
	Sub Total				**15**	**38.5**
Femoral Only	Advance	Advance	Advance	-	1	2.6
	Duracon	Duracon	Duracon	-	1	2.6
	Genesis II	Genesis II	Genesis II	-	1	2.6
	PFC Sigma	PFC Sigma	PFC Sigma	-	1	2.6
	Profix	Profix	Profix	-	1	2.6
	Trac	Trac	Trac	-	1	2.6
	Sub Total				**6**	**15.3**
Total					**39**	**100.0**

Note: *- equals component not exchanged*

Table K51: Components Used - Total Knee Primary to Minor Knee Revision

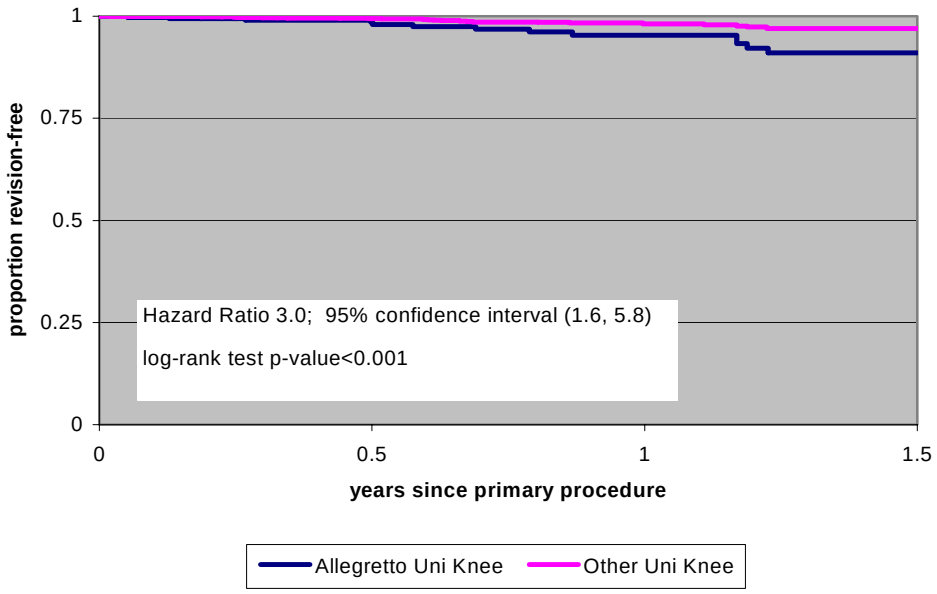
Revision type	*Primary* Femoral	*Primary* Tibial	*Primary* Insert	*Primary* Patella	*Revision* Patella	*Revision* Insert	*N*	*%*
Insert &	AMK	Coordinate	AMK	N/U	AMK	AMK	1	1.4
Patella	Genesis II	Genesis II	Genesis II	N/U	Genesis II	Genesis II	1	1.4
	Kinemax Pl	Kinemax Pl	Kinemax Pl	Kinemax Pl	Kinemax Pl	Kinemax Pl	1	1.4
	LCS	LCS	LCS	N/U	LCS	LCS	2	2.8
	Nexgen	Nexgen	Nexgen	N/U	Nexgen Mbk	Nexgen	2	2.8
	Nexgen Mbk	Nexgen Mbk	Nexgen Mbk	N/U	Nexgen Mbk	Nexgen Mbk	1	1.4
	Scorpio	Series 7000	Scorpio	N/U	Scorpio	Scorpio	6	8.3
	Series 7000	Series 7000	Series 7000	N/U	Series 7000	Series 7000	1	1.4
	Sub Total						**15**	**20.8**
Patella	AMK	AMK	AMK	N/U	AMK	-	4	5.6
only		Coordinate	AMK	N/U	AMK	-	1	1.4
	Duracon	Duracon	Duracon	N/U	Duracon	-	1	1.4
	Genesis	Genesis	Genesis	N/U	Genesis	-	1	1.4
	Genesis II	Genesis II	Genesis II	N/U	Genesis II	-	2	2.8
		MBK	Genesis II	N/U	Genesis II	-	1	1.4
	Interax	Interax	Interax	N/U	Interax	-	1	1.4
	LCS	LCS	LCS	N/U	LCS	-	6	8.3
				LCS	LCS	-	1	1.4
	Natural Knee	Natural Knee	Natural Knee	Natural	Natural Knee	-	1	1.4
	Nexgen	Nexgen	Nexgen	N/U	Nexgen Mbk	-	2	2.8
	Nexgen Mbk	Nexgen Mbk	Nexgen Mbk	N/U	Nexgen Mbk	-	1	1.4
	Trac	Trac	Trac	N/U	AGC	-	1	1.4
	Sub Total						**23**	**31.9**
Insert	Advance	Advance	Advance	N/U	-	Advance	1	1.4
only	Advantim	Advantim	Advantim	N/U	-	Advantim	1	1.4
	Duracon	Duracon	Duracon	N/U	-	Duracon	4	5.6
				Duracon	-	Duracon	6	8.3
	Genesis II	Genesis II	Genesis II	N/U	-	Genesis II	2	2.8
				Genesis	-	Genesis II	1	1.4
		MBK	Genesis II	N/U	-	Genesis II	1	1.4
	LCS	LCS	LCS	N/U	-	LCS	5	6.9
				LCS	-	LCS	3	4.2
	Nexgen	Nexgen	Nexgen	N/U	-	Nexgen	4	5.6
				Nexgen M	-	Nexgen	1	1.4
	PFC Sigma	PFC Sigma	PFC Sigma	N/U	-	PFC Sigma	1	1.4
	Profix	Profix	Profix	N/U	-	Profix	1	1.4
				Profix	-	Profix	1	1.4
	Scorpio	Series 7000	Scorpio	Scorpio	-	Scorpio	1	1.4
	Trac	Trac	Trac	AGC	-	Trac	1	1.4
	Sub Total						**34**	**47.2**
Total							**72**	**100.0**

Note: *N/U equals not used*
- *equals component not exchanged*

Table K52: Components Used - Total Knee Primary to Revision for Infection - All components removed

Primary Total Knee	*Revision* Patella	*Number*	*%*
Duracon	Cement Spacer/Antibiotic	2	40.0
Genesis II	Cement Spacer/Antibiotic	1	20.0
Profix	Knee Spacer (Biomet)	2	40.0
Total		**5**	**100.0**

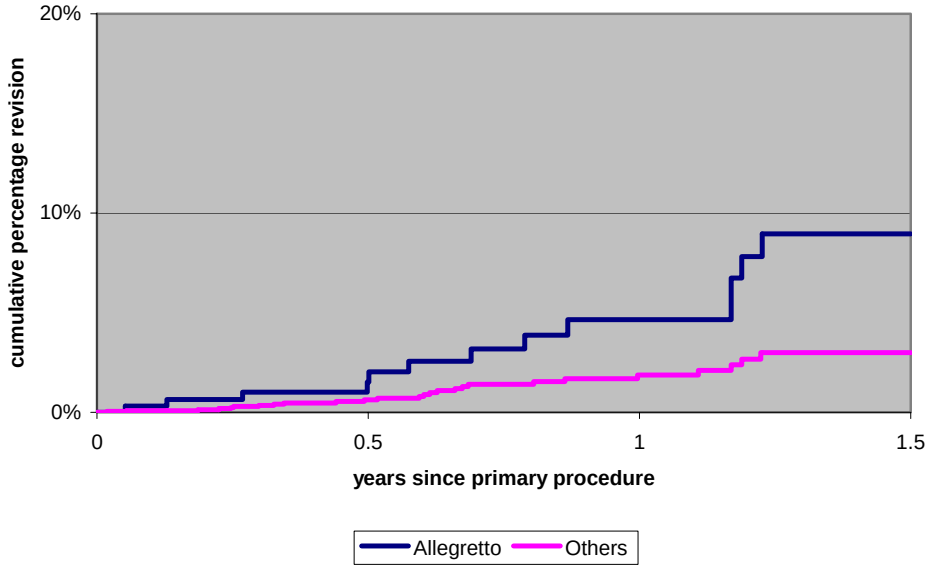
Graph K5: Kaplan Meier - Survival of Unicompartmental Knees



	Number at risk at start of the period			
	0	***0.5***	***1***	***1.5***
Allegretto Uni Knee	332	194	106	39
Others	2530	1267	525	128

Log-rank test for equality over strata (Allegretto v others) $\chi^2(1) = 12.0$; p-value=0.0005

Graph K6: Cumulative percentage of Revision of Unicompartmental Knee Primary Procedures



AOA National Joint Replacement Registry
Cement Data

Introduction

In this section of the report the Registry details the use of cement in primary and revision hip and knee replacement. This is for the period 1/9/99 to 31/12/2001.

Cement Use in Hip Replacement

Table C1 presents information on the use of cement in primary partial and total hip replacements. Cement use for both the femoral and acetabular components has been identified separately. The four most common cements account for 74.3% of femoral stem fixation and 71.3% for acetabular fixation. Cement containing antibiotic is used in almost 40% of stem fixation and 22% of acetabular fixation.

Antibiotic cement is used more frequently in revision hip surgery. It is utilised in approximately 70% of cement fixation for both the femoral and acetabular components (Table C2). It is not uncommon for surgeons, in the same operation, to use different types of cement for the different components. There is also occasional mixing of different cements for the same component. On most occasions when this occurs, it is usually a mixture of the same type of cement with and without antibiotic.

Cement Use in Knee Replacement

The most common cement for fixation of all components in primary knee replacement is Palacos R. Cement containing antibiotic is used in almost half of all components cemented (Table C3).

Cement containing antibiotic is used more frequently in knee revision surgery. Depending on the particular components, it is used between 70% and 80% of the time (Table C4).

Number of Different Types of Cement Used

As mentioned there are several major cements, which are used in the majority of procedures. It is of note that well over 20 different types of cement have been recorded. Many of these do not have any significant outcome data.

Table C1: Primary Hip Replacement - Top Ten Cements used by Location

Femur	*Number*	***%***	***Acetabulum***	***Number***	***%***
Simplex P	4368	36.1	Simplex P	1551	29.9
CMW 1 Plain	1682	13.9	CMW 1 Plain	964	18.6
Antibiotic Simplex	1593	13.2	Palacos R	634	12.2
Palacos R	1340	11.1	Antibiotic Simplex	551	10.6
Palacos E	573	4.7	Simplex Tobra	316	6.1
Simplex Tobra	573	4.7	CMW 1G	278	5.4
CMW 1G	545	4.5	CMW 2 Plain	260	5.0
CMW 2 Plain	273	2.3	Palacos E	192	3.7
CMW 3 Plain	263	2.2	CMW 3 Plain	128	2.5
CMW 3G	206	1.7	CMW 2G	118	2.3
Other Types (16)	683	5.6	Other (13)	189	3.6
Total	**12099**	**100.0**	**Total**	**5181**	**100.0**

Note: *primary hip replacement is minus resurfacing and thrust plates*
more than one type of cement was used in some procedures

Table C2: Revision Hip Replacement - Top Ten Cements used by Location

Femur	*Number*	***%***	***Acetabulum***	***Number***	***%***
Antibiotic Simplex	229	22.9	Palacos R	242	28.3
Palacos R	170	17.0	CMW 1G	129	15.1
Simplex P	165	16.5	Antibiotic Simplex	124	14.5
Simplex Tobra	131	13.1	Simplex P	98	11.5
CMW 1G	89	8.9	CMW 1 Plain	87	10.2
CMW 1 Plain	61	6.1	Simplex Tobra	79	9.3
Palacos E	38	3.8	CMW 2 Plain	27	3.2
CMW 3G	33	3.3	CMW 2G	22	2.6
CMW 3 Plain	18	1.8	Palacos E	17	2.0
CMW 2 Plain	15	1.5	CMW 3G	11	1.3
Other types (11)	49	4.9	Other types(8)	18	2.1
Total	**998**	**100.0**	**Total**	**854**	**100.0**

Note: *more than one type of cement was used in some procedures*

Table C3: Primary Knee Replacement - Top Ten Cements used by Location

Femur	*N*	*%*	*Tibia*	*N*	*%*	*Patella*	*N*	*%*
Palacos R	2910	24.6	Palacos R	3495	21.1	Palacos R	1590	24.5
CMW 1 Plain	2287	19.3	CMW 1 Plain	3061	18.5	Simplex P	1056	16.3
Simplex P	1965	16.6	CMW 2 Plain	2810	17.0	CMW 1 Plain	1007	15.5
CMW 2 Plain	1464	12.4	Simplex P	2772	16.8	CMW 2 Plain	916	14.1
Antibiotic Simplex	1105	9.3	Antibiotic Simplex	1388	8.4	Antibiotic Simplex	817	12.6
CMW 1G	1062	9.0	CMW 1G	1364	8.2	CMW 1G	411	6.3
CMW 2G	257	2.2	Simplex Tobra	544	3.3	Simplex Tobra	367	5.7
Palamed	226	1.9	CMW 2G	307	1.9	Palamed	81	1.2
Simplex Tobra	225	1.9	Palamed	244	1.5	Sulcem 3	72	1.1
Palacos E	85	0.7	Palacos E	153	0.9	CMW 2G	39	0.6
Other types (11)	238	2.0	Other types (12)	396	2.4	Other types (11)	139	2.1
Total	**11824**	**100.0**		**16534**	**100.0**		**6495**	**100.0**

Note: *more than one type of cement was used in some procedures*

Table C4: Revision Knee Replacement - Top Ten Cements used by Location

Femur	*N*	*%*	*Tibia*	*N*	*%*	*Patella*	*N*	*%*
Palacos R	397	38.3	Palacos R	427	35.7	Palacos R	173	34.9
CMW 1G	166	16.0	CMW 1G	214	17.9	CMW 1G	79	15.9
Antibiotic Simplex	136	13.1	Antibiotic Simplex	139	11.6	Antibiotic Simplex	59	11.9
CMW 2 Plain	78	7.5	CMW 2 Plain	101	8.5	CMW 2 Plain	48	9.7
CMW 1 Plain	68	6.6	CMW 1 Plain	80	6.7	Simplex Tobra	39	7.9
Simplex Tobra	66	6.4	Simplex Tobra	74	6.2	CMW 1 Plain	35	7.1
Simplex P	48	4.6	Simplex P	62	5.2	Simplex P	28	5.6
CMW 2G	32	3.1	CMW 2G	41	3.4	CMW 2G	12	2.4
Palamed	13	1.3	Palamed	15	1.3	Palamed	6	1.2
CMW 3G	9	0.9	Palacos E	13	1.1	CMW 3G	5	1.0
Other types (7)	23	2.2	Other types(7)	29	2.4	Other types (6)	12	2.4
Total	**1036**	**100.0**	**Total**	**1195**	**100.0**	**Total**	**496**	**100.0**

Note: *more than one type of cement was used in some procedures*

Mortality Following Joint Replacement Surgery

Introduction

Mortality information is being presented for the first time. This information has been obtained by matching Registry data with the National Death Index (NDI). The NDI is a database of approximately 2.7 million records maintained by the Australian Institute of Health and Welfare. The NDI contains records of all deaths occurring in Australia since 1980. These have been provided by the Registrars of Births, Deaths and Marriages in each State and Territory.

The NDI has strict controls over access to its data (AIHW Act, 1987 and the Privacy Act, 1988) and applications for access must gain approval from the host institution and/or from the Australian Institute of Health and Welfare (AIHW) Ethics Committee. The AOA NJRR submitted a successful application earlier this year.

Subsequently the AIHW has undertaken a match of NDI and Registry data for the period September 1999 to December 2000. This was performed using a probabilistic record linkage package (Integrity) and was undertaken using multiple passes, which grouped the data, based on different characteristics (name, date of birth and gender) each time. The NDI provided data for 837 potential 'matches'. After a careful analysis of the results the Registry rejected 141 'matches' on the basis of differences in name, date of birth, address of individuals and date of death. The final number of NDI matches was 696 deaths related to 719 procedures (569 hip procedures and 150 knee procedures).

Mortality Associated with Hip Replacement

The mortality associated with hip replacement varies depending on the type of hip replacement that has been undertaken. Mortality is least for primary total hip replacement. These figures are for all diagnoses including the small number of individuals that had primary total hips for tumour (20).

It is known that revision surgery is associated with an increased incidence of complications and mortality when compared to primary total hip replacement. The results certainly demonstrate an increased mortality risk. There is close to 2.5 times greater mortality with revision surgery when compared to primary total hip replacement (Table M1).

The greatly increased mortality associated with partial hip replacement (30.9%) is a consequence of the underlying diagnosis. From the 2001 report it is evident that 94.3% of partial hip replacements had a diagnosis of fractured neck of femur. It is well established that this is associated with high mortality rates. There are differences in mortality depending on the type of partial replacement used (Table M2 & Graph M2). As may well be anticipated the survival of patients receiving bipolar prostheses is better. It will become evident with time why this difference exists, however it is likely that it relates to patient selection. It is not clear at this stage if the same is true for the observed differences between the Austin-Moore and Thompson type prostheses (Graph M3). The indications for the use of these components are largely the same and any difference in selection is likely to be related to surgeon preference rather than patient specific characteristics. Under these circumstances it would be expected that survival would be similar for both prostheses.

The log rank test and Kaplan Meier estimation of survivorship and resulting plot are demonstrated (Graph M3). The Hazard Ratio 1.44, 95% CI (1.09, 1.89) alters when adjusted for age and gender (0.82 95% CI (0.62, 1.08). Therefore it appears that currently there is no difference in survival for patients with an Austin Moore or a Thompson prosthesis. The Registry will re-examine this issue in the 2003 Report.

Mortality Associated with Knee Replacement

The initial results for total knee replacement indicate that primary total knee has similar mortality rates to primary total hip (Tables M2 & M3). Primary unicompartmental knee replacement has a lower mortality risk than primary total knee. Mortality following revision knee replacement is greater than primary total knee. This is about half of what has been observed for revision hip. It is important to understand however, that as yet there has not been a detailed analysis of these results. The impact of factors such as age, timing of surgery, bilateral procedures amongst others will need to be examined.

Table M1: Number and percentage of people who died following Hip Replacement for Hip procedure between Jan 1999 and Dec 2000

Type of hip replacement	*Number who died*	*Number of procedures*	*% died*
Primary Partial Hips	389	1258	30.9
Primary Total Hips	118	4076	2.9
Revision Hip	62	872	7.1
Total	**569**	**6206**	**9.2**

Graph M1: Kaplan Meier - Survival following Hip Procedure

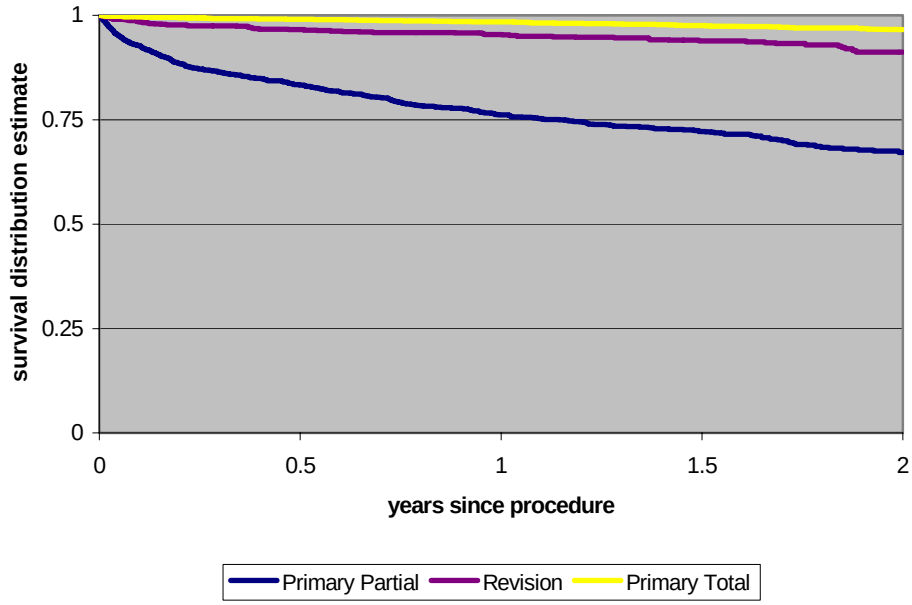
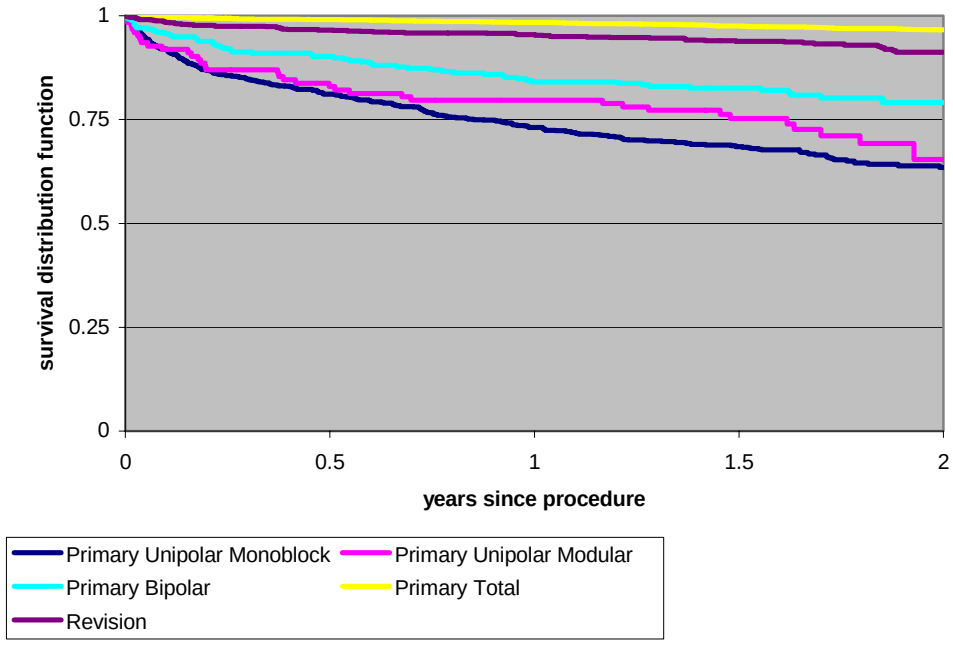


Table M2: Number and percentage of people who died following Hip Replacement for Hip procedure between Jan 1999 and Dec 2000

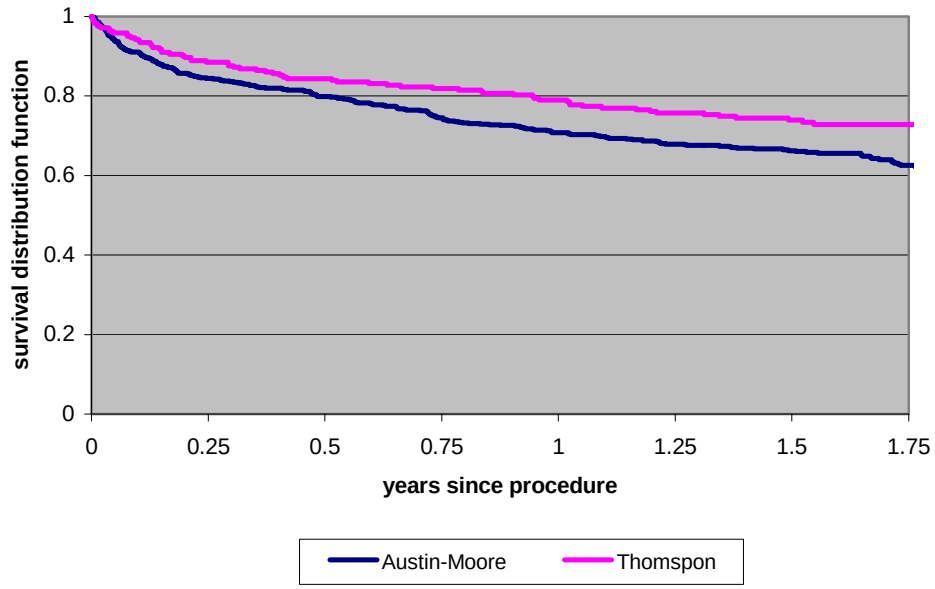
Type of hip replacement	*Number who died*	*Number of procedures*	*% died*
Primary Bipolar	53	276	19.2
Primary Unipolar Monoblock	300	859	34.9
Austin-Moore Type	*(235)*	*(616)*	*(38.1)*
Thompson Type	*(65)*	*(243)*	*(26.7)*
Primary Unipolar Modular	36	123	29.3
Primary Resurfacing Hip	1	95	1.1
Primary Thrust Plate	0	15	0.0
Primary Total Hip	117	3966	3.0
Revision Hip	62	872	7.1
Total	**569**	**6206**	**9.2**

Graph M2: Kaplan Meier - Survival following Hip Procedure including Types of Partials



	Number at risk at start of the period					
	0	***0.5***	***1***	***1.5***	***2***	***2.5***
Primary Unipolar monoblock	859	697	628	470	147	42
Primary Bipolar	276	249	232	171	50	11
Primary Unipolar modular	123	102	98	72	14	1
Primary Total Hip	4076	4037	4011	2852	817	134
Revision Hip	872	842	832	577	156	25

Graph M3: Kaplan Meier - Survival following Unipolar Monoblock Primary



	Number at risk at start of the period					
	0	***0.5***	***1***	***1.5***	***1.75***	***2***
Primary Unipolar monoblock	616	492	436	324	200	138
Primary Bipolar	243	205	192	146	58	9

Hazard Ratio 1.44 95% CI (1.09, 1.89)
Hazard Ratio, adjusted for age and sex 0.82 95% CI (0.62, 1.08)

Table M3: Number and percentage of people who died following Knee Replacement for Knee procedure between Jan 1999 and Dec 2000

Type of knee replacement	*Number who died*	*Number of procedures*	*% died*
Patellar/trochlear	0	27	0.0
Unicompartmental Knee	12	649	1.8
Primary Total Knee	114	4543	2.5
Revision Knee	24	632	3.8
Total	**150**	**5851**	**2.6**

Appendix 1

PATIENT CONSENT AND CONFIDENTIALITY GUIDELINES

Patient Consent

The Registry obtains consent to include information from individuals undergoing joint replacement. This is done by using the 'opt off' approach. The implementation of the new Commonwealth Legislation at the end of last year resulted in the Registry meeting the Privacy Commission to ensure that the system used for patient consent is within the privacy guidelines.

Using this approach, patients are provided with a Patient Information Sheet. This explains what information is required, how it is collected and the avenues to take should an individual not want their information included in the Registry. The information is clearly explained. The information is provided to patients by surgeons and hospitals prior to surgery. To accommodate those patients that may wish to opt off, or have enquires or issues to discuss, a freecall number *(no cost to the patient*) has been implemented at the Registry.

Patient Confidentiality

Joint replacement patients will not be contacted directly by the Registry. No individual patient will be identified during analysis or in the reports and publications produced by the Registry. Patient operative and prostheses data will be managed in accordance with the Guidelines for the Protection of Privacy in the Conduct of Medical Research. Personal data collected is for use by the AOA National Joint Replacement Registry only. Further to this the Registry is a Federal Quality Assurance Activity *(see below)* and all information is protected.

Data Management & Confidentiality

The Data Management and Analysis Centre, University of Adelaide undertakes data entry, validation and analysis and provides secure data storage.

The DMAC was established in 1995. Dr Philip Ryan, Senior Lecturer in Public Health, heads the DMAC. The centre staff includes data managers, database programmers, statisticians and data assistants from the Department of General Practice and the Department of Public Health. It is engaged in an increasing variety of work, including clinical trials, pharmacoepidemiological studies, consultations and cohort studies.

The list of personnel with access to identified Registry information is as follows:

- Chairman Dr. David Davidson
- Director Professor Stephen Graves
- Coordinator Ms Lisa Ingerson
- Data Management and Analysis Centre Staff including data assistants and data manager, statisticians and programmers.

Declaration of the project as a Quality Assurance Activity ensures that Registry and DMAC staff are bound to maintain confidentiality. Confidentiality not only applies to individual patients but also includes surgeons and hospitals.

The DMAC has security systems to limit access to DMAC and Registry staff only. There are policies and procedures in place as well as software barriers to protect personal information. These include the use of codes, passwords and encryption.

The proforma used for data collection will be stored in a secure locked room at the DMAC. After a period of time the forms will be optically scanned and electronically stored on either compact disk or microfiche. As with all data these will be securely stored. All data will be retained in accordance with good scientific practice.

Surgeon Confidentiality

Surgeon confidentiality is assured. The purpose of the Registry is to provide demographic and outcome information relevant to joint replacement surgery. It is not designed or capable of monitoring the performance of individual surgeons. Surgeon name is not recorded in the Registry database. In addition to this, the AOA Registry Management Committee made a decision in October 1999 to remove surgeon name from any Registry forms. The Board of the AOA ratified this decision. As a consequence of this, Registry staff blackout surgeon name, whether it is hand written or printed on the hospital patient identification, on all forms received by the Registry.

It has always been thought however, that it is an important Registry function to provide a service to surgeons that allows them to monitor and audit their own performance. It is for this reason that surgeons have a choice to identify themselves by code. In this manner specific procedures can be linked with that code. This is an optional choice and there is no requirement that the surgeon code be completed. The codes are provided to surgeons by the AOA and Registry staff do not have access to those codes.

The intention is to provide surgeons with access to their own information through secure internet access. As yet the software has not been developed that would allow this to occur. It is important to emphasise that surgeons have the choice of using their code and that surgeon name is not recorded and also permanently removed from any of the Registry forms.

Federal Quality Assurance Activity

The Australian Orthopaedic Association National Joint Replacement Registry was declared a Federal Quality Assurance Activity by the then Federal Minister for Health and Aged Care, Dr Wooldridge, in March 1999 and again in November 2001. This ensures freedom from subpoena and absolute confidentiality of information held by the Registry.

The Quality Assurance legislation is part of the Health Insurance Act of 1973. This act was amended in 1992 to include quality assurance confidentiality. The Act operates on the underlying assumption that quality assurance activities are in the public interest.

A declaration as a quality assurance activity by the Commonwealth Minister of Health and Aged Care prohibits the disclosure of information which identifies individual patients or health care providers, that is known solely as a result of the declared quality assurance activity. It is not possible to provide identifying information to any individual or organisation including the government.

The protection provided by the declaration assures surgeons, hospitals and government that information supplied to the Registry remains confidential and secure. The act also protects persons engaging in those activities in good faith from civil liability in respect of those activities.

The declaration of the Registry as a Quality Assurance Activity is for an initial five-year period but covers information collected during this period indefinitely.

Appendix 1 cont.

HEALTH DEPARTMENTS

Health Departments in each state and territory were contacted about validating components of the Registry data. Information outlining the Registry was provided to the director of each department. The following departments have agreed to validate the Registry information on a quarterly basis:

South Australia, Northern Territory, Australian Capital Territory, Tasmania, Victoria, Western Australia and Queensland.

Western Australian Health Department
Access to WA Health Department Data requires authorisation by the Confidentiality of Health Information Committee prior to release. Approval was given on 14th March 2000.

Queensland Health Department
A deed of agreement was negotiated between the AOA and the QLD government through the QLD Health Department. The purpose of this Agreement is to allow hospitals to release information to the Registry.

New South Wales Health Department
Negotiations are ongoing with NSW Health Department.

AUSTRALIAN ORTHOPAEDIC ASSOCIATION
NATIONAL JOINT REPLACEMENT REGISTRY

PATIENT INFORMATION

INTRODUCTION - *about the Registry*

You are about to have a joint replacement. Joint replacement is very successful and most people do not require any further surgery following this procedure. However, a number of people who have a joint replacement may at some time in the future require another operation on that joint. This may occur due to a variety of reasons; the most common being that the joint replacement has worn out. Furthermore, differences between the many types of artificial joints available may affect the time at which they wear out and require replacing. In order to improve the success of this surgery, the Australian Orthopaedic Association has set up a National Joint Replacement Registry so that joint replacement and prostheses can be monitored.

The purpose of the registry is to assess the performance of all joint replacement. If a joint replacement is identified as having a problem, the Registry can assist hospitals to locate those people that may be effected. To do this it is important to record information on every person having a joint replacement. Approximately 50,000 people have joint replacement surgery each year in Australia. It is also important to record details on any subsequent operations and the reason the surgery was performed. By analysing this information it will be possible to identify the cause of any problems as well as determine which types of joint replacement have the best results. To be successful, the registry needs to gather information on as many people having hip or knee replacement surgery as possible. We are asking you to participate in the registry, by allowing us to document information relevant to your operation.

Your Involvement - *the information we need*

The information we require includes your name, date of birth, address, Medicare number, hospital identity number, the name of the hospital and the reason you are having a joint replacement. This information is necessary to accurately link you to the artificial joint inserted as well as linking any following joint surgery you may have, to your previous records. We will also record the day of the operation, which joint was operated on and the type of artificial joint used. No other personal information is recorded. Hospitals and government will send reports to the registry on a regular basis to validate the information collected.

Information - *how we will keep your information confidential*

Your personal information is confidential and cannot be used outside the registry. Procedures are in place to protect your information and to keep it confidential. When your details have been entered into the registry your record will be given a specific registry number. In addition you cannot be identified in any reports produced by the registry.

How we will collect the information

Although we are asking to record your operation details in the registry you are not required to do anything. Your surgeon and/or theatre staff will complete the form that contains your personal details at the time of your operation and send it to us. The information will be entered into the registry computer.

Risks and Benefits - *to you*

There are no risks to you by having your details in the registry. Your information is protected and we are not allowed to identify you by law.

The registry will produce general reports on a variety of factors that influence the success of joint replacement surgery. This will improve the quality of future joint replacement surgery.

What to do if you don't want to be in the Registry

We understand that not everyone is comfortable about having his or her personal details documented in a registry. If you feel this way and do not want your details recorded please contact Ms Lisa Ingerson, Project Coordinator, on 1800 068 419 *(freecall)*. A decision on whether or not you wish to be involved in the registry does not affect your treatment in any way.

If you have any questions, concerns or require further information on the National Joint Replacement Registry please do not hesitate to contact Ms. Lisa Ingerson.

Appendix 3

ICD 10 AM AND CMBS CODES

The Registry identified the following ICD 10 AM and CMBS codes for data collection.

ICD 10 AM CODES

HIP PROCEDURES

Primary Total Hip replacement

Partial Hip	49315-00	partial arthroplasty (excludes Austin Moore)
	47522-00	austin moore
Single	49318-00	total arthroplasty of hip unilateral
Bilateral	49319-00	total arthroplasty of hip bilateral

Revision Hip

49312-00	excision arthroplasty of hip (removal of prosthesis without replacement)
49324-00	revision of total arthroplasty of hip
49327-00	revision of total arthroplasty with bone graft to acetabulum
49330-00	revision of total arthroplasty with bone graft to femur
49333-00	revision of total arthroplasty with bone graft to acetabulum and femur
49339-00	revision of total arthroplasty of hip with anatomic specific allograft to acetabulum
49342-00	revision of total arthroplasty of hip with anatomic specific allograft to femur
49345-00	revision of total arthroplasty with anatomic specific allograft to acetabulum and femur
49346-00	revision of partial arthroplasty hip replacement

KNEE PROCEDURES

Patellofemoral joint of knee

49534-00	total replacement arthroplasty of patellofemoral joint of knee

Unicompartmental knee

49517-00	hemi arthroplasty of knee

Total knee

Single	49518-00	total arthroplasty of knee uinlateral
Bilateral	49519-00	total arthroplasty of knee bilateral
	49521-00	total arthroplasty of knee with bone graft to femur unilateral
	49521-01	total arthroplasty of knee with bone graft to femur bilateral
	49521-02	total arthroplasty of knee with bone graft to tibia unilateral
	49521-03	total arthroplasty of knee with bone graft to tibia bilateral
	49524-00	total arthroplasty of knee with bone graft to femur and tibia unilateral
	49524-01	total arthroplasty of knee with bone graft to femur and tibia bilateral

Revision knee

49515-00	removal-prostheses from knee
49527-00	revision of total arthroplasty of knee
49530-00	revision of total arthroplasty of knee with bone graft to femur
49530-01	revision of total arthroplasty of knee with bone graft to tibia
49533-00	revision of total arthroplasty of knee with bone graft to femur and tibia
49554-00	revision of total arthroplasty of knee with anatomic specific allograft

Appendix 3 cont.

CMBS CODES

HIP PROCEDURES

Partial hip

49315 HIP, arthroplasty of, unipolar or bipolar

Primary hip

49309 HIP, arthrectomy or excision arthroplasty of, including removal of prosthesis (austin moore or similar (non-cement))
49318 HIP, total replacement arthroplasty of, including minor bone grafting
49319 HIP, total replacement arthroplasty of, including major bone grafting, if performed-bilateral
49321 HIP, total replacement arthroplasty of, including major bone grafting, including obtaining of graft

Revision hip

49312 HIP, arthrectomy or excision arthroplasty of, including removal of prosthesis cemented, porous coated of similar)
49324 HIP, total replacement arthroplasty of, revision procedure including removal of prosthesis
49327 HIP, total replacement arthroplasty of, revision procedure requiring bone grafting to acetabulum, including obtaining of graft
49330 HIP, total replacement arthroplasty of, revision procedure requiring bone grafting to femur, including obtaining of graft
49333 HIP, total replacement arthroplasty of, revision procedure requiring bone grafting to both acetabulum and femur, including obtaining of graft
49336 HIP, revision of a fracture of the femur where revision total hip replacement is required as part of the treatment of the fracture
49339 HIP, revision total hip replacement of, requiring anatomic specific allograft of proximal femur greater than 5cm in length
49342 HIP, revision total hip replacement of, requiring anatomic specific allograft of acetabulum
49345 HIP, revision total hip replacement of, requiring anatomic specific allograft of both femur and acetabulum
49346 HIP, revision arthroplasty with replacement of acetabular liner or ceramic head, not requiring removal of femoral component or acetabular shell

Appendix 3 cont.

CMBS CODES

KNEE PROCEDURES

Patellofemoral joint of knee

49534 KNEE, patellofemoral joint of, total replacement arthroplasty as a primary procedure

Unicompartmental knee

49517 KNEE, hemiarthroplasty of

Primary knee

49518 KNEE, total replacement arthroplasty of,
49519 KNEE, total replacement arthroplasty of, including associated minor grafting, if performed-bilateral
49521 KNEE, total replacement arthroplasty of, requiring major bone grafting to femur or tibia, including obtaining of graft
49524 KNEE, total replacement arthroplasty of, requiring major bone grafting to femur and tibia, including obtaining of graft

Revision knee

49512 KNEE, arthrodesis of, with removal of prosthesis
49515 KNEE, removal of prosthesis, cemented or uncemented, including associated cement, as the first stage of a 2 stage procedure
49527 KNEE, total replacement arthroplasty of, revision procedure, including removal of prosthesis
49530 KNEE, total replacement arthroplasty of, revision procedure, requiring bone grafting to femur or tibia, including obtaining of graft and including removal of prosthesis
49533 KNEE, total replacement arthroplasty of, revision procedure, requiring bone grafting to femur and tibia, including obtaining of graft and including removal of prosthesis
49554 KNEE, revision of total replacement of, by anatomic specific allograft of tibia or femur